Vol. 883 Number 1

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OFFICIAL GAZETTE

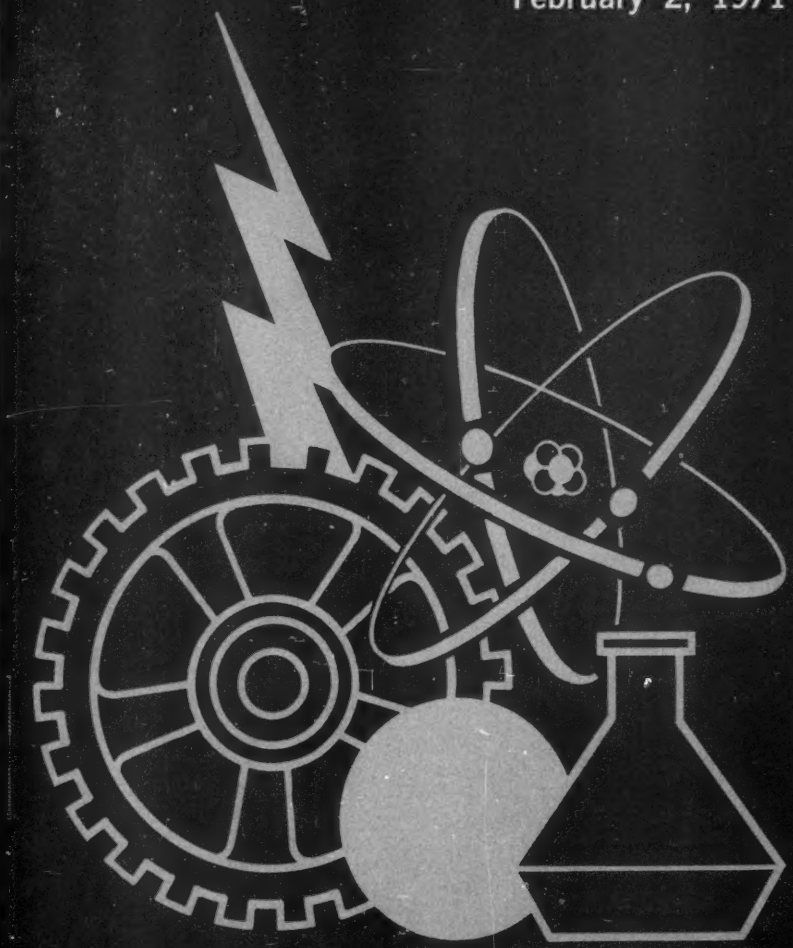
of the

UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

February 2, 1971



U. S. DEPARTMENT OF COMMERCE

Patent Office

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VOLUME 883

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PATENT OFFICE NOTICES

Proposed Change of Drawing Requirements

[37 CFR Part 1]

Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6), the Patent Office proposes to amend Title 37 of the Code of Federal Regulations by revising sections 1.59, 1.84, 1.85, 1.123 and 1.165 and revoking sections 1.82 and 1.87.

All persons are invited to present their views, objections, recommendations, or suggestions in connection with the proposed changes to the Commissioner of Patents, Washington, D.C. 20231, on or before March 23, 1971, on which date a hearing will be held at 10:30 a.m., e.s.t., in Room 8–C–06, Building 2, 2011 Jefferson Davis Highway, Arlington, Va. All persons wishing to be heard orally at the hearing are requested to notify the Commissioner of Patents of their intended appearance. Any written comments or suggestions may be inspected by any person, upon written request, a reasonable time after the closing date for submitting comments.

These proposed changes would reduce the overall drawing size from 10 by 15 inches to 8½ by 14 inches while maintaining the same "sight" size available for drawings. This reduction permits the use of standard storage and reproduction equipment by both the applicants and the Patent Office and greatly simplifies processing.

Names will not be permitted on the drawings, thereby making additional space available for illustrations and tending to reduce the total number of sheets of drawing required. Further, certain formal requirements will be liberalized to permit the use of drawing materials other than bristol board and the filing of color prints in plant patent applications.

The proposed new rule language is as follows:

§ 1.59. *Papers of complete application not to be returned.*

Papers in a complete application, including the drawings, will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost.

§ 1.82. *Signature to drawing.* Revoked.

§ 1.84. *Standards for drawings.*

(a) *Paper and ink.*—Drawings must be made upon pure white paper of a thickness corresponding to two-ply or three-ply bristol board or upon flexible, strong, smooth, non-shiny, white, opaque, translucent or transparent material of a permanent nature which will permit erasure and correction with India ink on its face. The surface of the paper must be calendered and smooth and of a quality which will permit erasure and correction with India ink. India ink alone must be used for pen drawings to secure perfectly black solid lines. The use of white pigment to cover lines is not acceptable.

(b) *Size of sheet and margins.*—The size of a sheet on which a drawing is made must be exactly 8½ by 14 inches. One of the shorter sides of the sheet is regarded as its top. The drawing must include a top margin of two inches and bottom and side margins of one-quarter inch from the edges, thereby leaving a "sight" precisely 8 by 11¾ inches. Margin border lines are not permitted unless they are in non-reproducible blue color. All work must be included within the "sight." The sheets may be provided with two ¼ inch diameter holes having their centerlines spaced 1 1/16 inch below the top edge and 2¾ inches apart, said holes being equally spaced from the respective side edges.

(c) *Character of lines.*—All drawings must be made with drafting instruments or by photolithographic process which will give them satisfactory reproduction characteristics. Every line and letter must be absolutely black and permanent. This direction applies to all lines however fine, to shading, and to lines representing cut surfaces in sectional views. All lines must be clean, sharp, and solid, and fine or crowded lines should be avoided. Solid black should not be used for sectional or surface shading. Freehand work should be avoided wherever it is possible to do so.

* * * * *

(h) *Locations of signature and names.*—Revoked.

* * * * *

(j) *Arrangement of views.*—All views on the same sheet must stand in the same direction and should, if possible, stand so that they can be read with the sheet held in an upright position. If views longer than the width of the sheet are necessary for the clearest illustration of the invention, the sheet may be turned on its side so that the two-inch margin is on the right hand side. One figure must not be placed upon another or within the outline of another.

* * * * *

(l) *Extraneous matter.*—An inventor's, agent's, or attorney's signature, name, stamp, or address, or other extraneous matter, will not be permitted upon the face of a drawing, within or without the margin, except that the title of the invention and identifying indicia, to distinguish from other drawings filed at the same time, may be placed in erasable pencil within ¾ inch of the top edge.

* * * * *

§ 1.85. *Informal drawings.*

The requirements of § 1.84 relating to drawings will be strictly enforced. A drawing not executed in conformity thereto, if suitable for reproduction, may be admitted, but in such case the drawing must be corrected or a new one furnished, as required. The necessary corrections or mounting will be made by the Office upon applicant's request or permission and at his expense. (See §§ 1.21 and 1.165.)

§ 1.87. *Return of drawings.* Revoked.

§ 1.123. *Amendments to the drawing.*

(a) No change in the drawing may be made except by permission of the Office. Permissible changes in the construction shown in any drawing may be made only by the Office. A sketch in permanent ink showing proposed changes, to become part of the record, must be filed. The paper requesting amendments to the drawing should be separate from other papers.

* * * * *

§ 1.165. *Drawings.*

* * * * *

(b) The drawing may be in color and when color is a distinguishing characteristic of the new variety, the drawing must be in color. Two copies of color drawings must be submitted. Color drawings may be made either in permanent water color or oil, or in lieu thereof may be photographs made by color photography or properly colored on sensitized paper. Permanently mounted color photographs are acceptable. The paper in any case must correspond in size, weight and quality to the paper required for other drawings. See § 1.84. Non-permanently mounted copies will be correctly mounted at applicant's expense, § 1.21(l).

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Jan. 4, 1971.

Approved: Jan. 12, 1971.

RICHARD O. SIMPSON,
Acting Assistant Secretary for Science and Technology.

[F.R. Doc. 71–568; Filed 1–14–71; 8:49 a.m.]

Published in 36 F.R. 610, Jan. 15, 1971

Abbreviated First Actions on the Merits

Starting on or about February 1, 1971, and continuing for a trial period of up to twelve months, a newly developed form (PO–1142) will be used for first actions on the merits of patent applications involving claims subject to rejection and/or objection on statutory or other legal grounds.

The form is designed to furnish a clear, full, and complete first action including the reasons for rejection and/or objection together with such information and references as may be useful in judging the propriety of continuing the prosecution, all in accordance with the statute (35 U.S.C. 132); and it is intended to abridge the action with condensed language using essential words and phrases in abbreviated form, in order to expedite the prosecution and reduce the pendency time of applications awaiting examination. Where found necessary in exceptional cases, a regular action without the form will be used.

For abbreviation purposes, references referred to on the form will be designated by capital letters and identified on revised reference list PO–892, and their correlation as applied to the claims will be indicated by symbols illustrated and explained on the bottom of the form. Sections 100–103, and 112 of the patent statute are reproduced on the back of the form.

Summary sheet POL–326 will continue in use with all first actions, and has been revised to identify different parts of the sheet as "Part I" and "Part II." Form PO–1142 will be distinguished as "Part III," and if a second copy of the form is necessary and is used to complete the action it will be marked for distinction as "Part III*a*" (a regular typed page if annexed to an action with the form will be designated as "Part IV"). All parts of the action after Part I (Parts II, III, and IV) will each have numbered paragraphs starting with the numeral 1, and communications relating thereto may be properly identified by the number on the particular part (for example, paragraph 2 on Part III may be identified as paragraph III–2).

As noted, Form PO–1142 will be used only for first actions on the merits concerned with claims subject to rejection and/or objection on statutory or other legal grounds. It will not be used for any subsequent action nor a first action made final as in a continuing application.

Second actions on the merits will be final according to prevailing practice, and any reference referred to in these or subsequent actions will be identified by name or otherwise in conventional manner, not by capital letters as used on Form PO–1142. For this reason, use of conventional reference identification in response to all Office actions will be helpful.

Only one carbon copy of the action will be furnished in accordance with the Notice of October 21, 1970, entitled "Office Actions" and appearing in 880 O.G. 740.

All other Office policies, practices, and procedures remain in effect.

RICHARD A. WAHL,
Jan. 5, 1971. *Assistant Commissioner.*

Disclosure Document Program

This notice consolidates and supersedes the notices of Mar. 26, 1969 (862 O.G. 1) and Aug. 11, 1970 (878 O.G. 1) relating to the Patent Office Disclosure Document Program.

Under this program the Patent Office accepts and preserves, for a period of two years, papers referred to as "Disclosure Documents." These papers may be used as evidence of the dates of conception of inventions.

THE PROGRAM

A paper disclosing an invention and signed by the inventor or inventors may be forwarded to the Patent Office by the inventor (or by any one of the inventors when there are joint inventors), by the owner of the invention, or by the attorney or agent of the inventor(s) or owner. It will be retained for two years and then be destroyed unless it is referred to in a separate letter in a related patent application within said two years.

A Disclosure Document is not a patent application and the date of its receipt in the Patent Office will not become the effective filing date of any patent application subsequently filed. However, like patent applications, these documents will be kept in confidence by the Patent Office. If patent protection is desired, a patent application should be filed as soon as possible.

This program does not diminish the value of conventional witnessed and notarized records as evidence of conception of an invention, but it should provide a more credible form of evidence than that provided by the popular practice of mailing a disclosure to oneself or another person by registered mail. The program is made available as a service to those persons desiring to use it.

CONTENT OF DISCLOSURE DOCUMENT

Although there are no restrictions as to content and claims are not necessary, the benefits afforded by a Disclosure Document will depend directly upon the adequacy of the disclosure. Therefore, it is strongly urged that the document contain a clear and complete explanation of the manner and process of making and using the invention in sufficient detail to enable a person having ordinary knowledge in the field of the invention to make and use the invention. When the nature of the invention permits, a drawing or sketch should be included. The use or utility of the invention should be described, especially in chemical inventions.

The Disclosure Document must be limited to written matter or drawings on paper or other thin, flexible material, such as linen or plastic drafting material, having dimensions or being folded to dimensions not to exceed 8½ by 13 inches. Photographs also are acceptable. Each page should be numbered. Text and drawings should be sufficiently dark to permit reproduction with commonly used office copying machines.

A $10 fee is charged for filing a Disclosure Document. Payment must accompany the Disclosure Document when it is submitted to the Patent Office.

In addition to the $10 fee, the Disclosure Document must be accompanied by a stamped, self-addressed envelope and a separate paper in duplicate, signed by the inventor, stating that he is the inventor and requesting that the material be received for processing under the Disclosure Document Program. The papers will be stamped by the Patent Office with an identifying number and date of receipt, and the duplicate request will be returned in the self-addressed envelope together with a warning notice indicating that the Disclosure Document may be relied upon only as evidence and that a patent application should be diligently filed if patent protection is desired. The inventor's request may take the following form:

"The undersigned, being the inventor of the disclosed invention, requests that the enclosed papers be accepted under the Disclosure Document Program, and that they be preserved for a period of two years."

RETENTION

The Disclosure Document will be preserved in the Patent Office for two years after its receipt and will then be destroyed unless it is referred to in a separate letter in a related patent application filed within the two-year period. The Disclosure Document must be referred to in the separate letter by title, number, and date of receipt. Acknowledgment of receipt of such letters will be made in the next official communication or in separate letter from the Patent Office. Unless it is desired to have the Patent Office retain the Disclosure Document beyond the two-year period, it is not required that it be referred to in a patent application.

WARNING AS TO LIMITATIONS

The two-year retention period should not be considered to be a "grace period" during which the inventor can wait to file his patent application without possible loss of benefits. It should be recognized that in establishing priority of invention an affidavit or testimony referring to a Disclosure Document must usually also establish diligence in completing the invention or in filing the patent application since the filing of the Disclosure Document.

Inventors are also reminded that any public use or sale in the United States, or publication of the invention anywhere in the world, more than one year prior to the filing of a patent application on that invention will prohibit the granting of a patent on that invention.

If the inventor is not familiar with what is considered to be "diligence in completing the invention" or "reduction to practice" under the patent law, or if he has other questions about patent matters, the Patent Office advises him to consult an attorney or agent registered to practice before the Patent Office. Patent attorneys and agents may be found in the telephone directories of most major cities. Also, many large cities have associations of patent attorneys which may be consulted.

RICHARD A. WAHL,
Jan. 4, 1971. *Assistant Commissioner of Patents.*

United States Adopted Names

List No. 27

July 1, 1970 to October 31, 1970

The following nonproprietary names for the drugs described have been adopted by the USAN Council (the nomenclature committee sponsored by the American Medical Association, the American Pharmaceutical Association, and the United States Pharmacopeial Convention) in cooperation with the interested manufacturers. The designation "United States Adopted Names" (USAN) has been coined to distinguish these formally adopted nonproprietary names from other nonproprietary names. Adoption of such names does not imply en-

dorsement of the products involved by the A.M.A. Council on Drugs, the United States Pharmacopeia or the National Formulary.

Any comments or suggestions should be addressed to Doctor Joseph B. Jerome, Secretary, United States Adopted Names Council, American Medical Association, 535 N. Dearborn St., Chicago, Ill. 60610.

amadinone acetate: progestogen
amcinafal: topical anti-inflammatory
amedalin hydrochloride: antidepressant
amoxapine: antidepressant
aspartame: artificial sweetener
butirosin sulfate: antibacterial
cephacetrile sodium: antibiotic
daledalin tosylate: antidepressant
deterenol hydrochloride: anti-glaucoma
dexetimide: antiparkinsonism
difenoxin: antidiarrheal
enflurane: inhalation anesthetic
epicillin: antibiotic
estrofurate: estrogen
fluocloronide: glucocorticoid
fluocinonide: glucocorticoid
fosfomycin: antibiotic
mixidine: anti-anginal
nefopam hydrochloride: muscle relaxant
pemerid nitrate: antitussive
polignate sodium: anti-ulcer (pepsin inhibitor)
robenidine hydrochloride: veterinary coccidiostat
sevoflurane: inhalation anesthetic
sisomicin: antibiotic
suncillin sodium: antibiotic
suxemerid sulfate: antitussive
tesicam: anti-inflammatory
ticarbodine: anthelmintic
treloxinate: anticholesteremic
trestolone acetate: antineoplastic androgen

Patent Suits

2,817,737, W. W. Morris, ELECTRICAL RESISTANCE NETS, **filed** Nov. 15, 1970, D.C.N.J. (Newark), Doc. 1534–70, *Neoweld Corporation and Connecticut Dev. Credit Corp.* v. *Cooperheat and Peter J. Cooper.*

2,823,775, R. E. Zwayer, HOIST MOTOR AND BRAKE CONTROL, **filed** Nov. 17, 1970, D.C., E.D. Mich. (Detroit), Doc. 35671, *Aro Corp.* v. *Mich. Pneumatic Tool, Inc. and Irving Wine.*

2,884,049, G. A. Scharmer, STAINLESS SHEET METAL WORK SURFACES, **filed** Feb. 1, 1966, D.C., E.D.N.Y. (Brooklyn), Doc. 66–C–85, *George A. Scharmer* v. *Agnew Associates, Inc.* Complaint dismissed with prejudice, Nov. 19, 1970.

2,895,950, V. K. Krieble, COMPOSITIONS CONTAINING HYDROPEROXIDE POLYMERIZATION CATALYST AND ACRYLATE ACID DIESTER; **3,435,012,** B. W. Nordlander, ANAEROBIC SEALANT COMPOSITION CONTAINING MONOACRYLATE ESTERS, **filed** Oct. 21, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70–2378–EC, *Loctite Corporation* v. *Tokyo Three Bond Company.*

2,935,776, Clark and Stubberfield, CABLE SHACKLE, **filed** Nov. 9, 1970, D.C., E.D. Calif. (Sacramento), Doc. C–S–1852, *A-I Steel and Iron Foundry, Ltd.* v. *D. Ehlert, doing business as Ehlert Foundry & Manufacturing.*

2,945,666, Freeman and Vaudreuil, BALL VALVE, **filed** Oct. 30, 1970, D.C., S.D. Tex. (Houston), Doc. CA–70–H–1194, *James Bury Corp.* v. *Kitamura Valve Mfg. Co., Ltd. and KTM Industries, Inc.*

2,951,761, J. T. Stephan, FISH BAIT, **filed** July 31, 1968, D.C., Idaho (Boise), Doc. C–1–69–60, *Puget Sound Salmon Egg Company, Inc.* v. *Shoshoni, Inc., Lucky Brands, Inc. and K. Clint Stephens.* Judgment and decree restraining defendants from infringement, Nov. 6, 1970.

2,958,872, F. J. Meyer, SWIMMING POOL COVER, **filed** Nov. 6, 1970, D.C., E.D.N.Y. (Brooklyn), Doc. 70–C–k386, *Fred J. Meyer, Jr.* v. *Roslyn Cover Company.*

3,001,191, E. O. Richter, HEIGHT FINDING RADIO DETECTION AND RANGING DEVICE, **filed** Nov. 4, 1970, U.S. Court of Claims, Washington, D.C., Doc. 382–70, *Lockheed Aircraft Corporation* v. *The United States of America.*

3,002,868, H. Bolvin, SPONGE BACK FLOOR COVERING, **filed** Mar. 16, 1966, D.C., S.D.N.Y., Doc. 66–C–754, *The Flintkote Co.* v. *Armstrong Cork Co., et al.* Judgment order, defendants Armstrong Cork Co., Empire Carpet Corp. and Fashion Floors Inc. have judgment against the plaintiff dismissing the complaint, Nov. 5, 1970.

3,018,968, G. S. Levey, CLOSED SYSTEM RECIRCULATING ASSEMBLY, **filed** Apr. 1, 1969, D.C., S.D. Tex. (Houston), Doc. 69–H–288, *The Spee-Flo Manufacturing Corporation* v. *Gray Company, Inc.* Order, complaint and defendant's counterclaims be dismissed without prejudice, Nov. 16, 1970.

3,077,951, K. E. Ramsey, LIFT TRUCK MAST OPERATION SEQUENCE MECHANISM, **filed** Nov. 13, 1970, D.C., E.D. Mich. (Detroit), Doc. 35651, *Clark Equipment Co.* v. *Knickerbocker Co.*

3,100,897, S. Langer, COVERALL, **filed** June 14, 1968, D.C., S.D.N.Y., Doc. 68–C–2426, *Andray Products, Inc.* v. *Gimbel Brothers, Inc. et al.* Consent judgment, defendant's hereinafter forever enjoined, Oct. 28, 1970.

3,104,924, F. E. Capel, LAMP CONNECTOR, **filed** Oct. 28, 1970, D.C., S.D.N.Y., Doc. 70–C–4748, *Ward Foods, Inc.* v. *Spartans Industries, Inc.*

3,134,718, A. Nobile, PREGNA-1,4-DIENES AND COMPOSITIONS CONTAINING SAME, **filed** Nov. 9, 1970, D.C.N.J. (Newark), Doc. 1499–70, *Schering Corporation* v. *Moore-Kirk Laboratories, Inc.*

3,146,290, D. M. Park, ELECTRONIC MUSIC CIRCUIT; **3,383,452,** Park and Campbell, MUSICAL INSTRUMENT; **Re. 26,521,** D. M. Park, AUTOMATIC REPETITIVE RHYTHM INSTRUMENT TIMING CIRCUITRY, **filed** May 23, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c1123, *The Seeburg Corporation* v. *National Baron Corp.* Order, case reinstated, Oct. 8, 1970.

3,166,154, J. M. Titzel, PORTABLE SCAFFOLDS AND WORK TOWERS, **filed** Nov. 23, 1970, D.C., W.D. Penn. (Pittsburgh), Doc. 70–1333, *Titzel Engineering Co., Inc.* v. *M. & G. Industrial Associates, Inc. and Robert N. Monroe.*

3,169,612, Wolf, Holland and Sharp, OVERHEAD DOOR CONSTRUCTION; **D. 194,094,** Wolf and Holland, OVERHEAD GARAGE DOOR, **filed** Mar. 1, 1967, D.C., E.D. Wis. (Milwaukee), Doc. 67–C–335, *Frantz Manufacturing Company* v. *Phenix Manufacturing Co., Inc.* Judgment, Patent No. 3,169,612 invalid and unenforceable. D. 194,094 valid and defendant enjoined, Nov. 11, 1970.

3,170,063, J. A. Webb, HIGH SPEED BINARY ADDER AND/OR SUBTRACTOR CIRCUIT, **filed** Nov. 9, 1970, D.C., N.D. Tex. (Dallas), Doc. CA–3–4277B, *Joseph A. Webb, Sr.* v. *Motorola Semiconductor Products, Inc.*

3,172,824, S. F. Mulford, EVAPORATOR CONSTRUCTION, **filed** Feb. 13, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c310, *Aqua Chem, Inc. and Richard W. Goeldner* v. *Baldwin Lima Hamilton Corp.* Plaintiffs' complaint dismissed and defendant awarded its costs, Sept. 28, 1970.

3,200,228, A. F. Gawron, SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE, **filed** Nov. 16, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c2858, *Skil Corporation* v. *Rockwell Manufacturing Company and Wen Products, Inc.*

3,264,411, M. J. Reaves, TELEPHONE CONFERENCE SYSTEMS, **filed** Nov. 20, 1970, D.C., N.D. Tex. (Dallas), Doc. CA–3–4308–A, *Michael John Reaves* v. *David Wade Industries.*

3,312,124, Meier and Meier, STEERING-WHEEL ASSEMBLY FOR AUTOMOTIVE VEHICLES, **filed** Nov. 3, 1970, D.C., E.D. Mich. (Detroit), Doc. 35605, *Kamei-Autokomfort, Superior Industries, Inc.* v. *Anton Co., Inc.*

3,313,477, G. Brown, TRANSPARENT BANK CONSTRUCTION HAVING COIN SORTING MEANS, **filed** Nov. 12, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c2830, *Grant Co.* v. *Syndicate Products Inc., Spinrite Yarns & Dyers, F. W. Woolworth and Ted Kienes.*

3,330,182, Gerber and Webster, DEVICE FOR EXPOSING DISCRETE PORTIONS OF A PHOTOSENSITIVE SURFACE TO A VARIABLE INTENSITY LIGHT BEAM, **filed** Oct. 25, 1968, D.C., S.D. Ohio (Cincinnati), Doc. 6893, *The Gerber Scientific Instrument Co.* v. *Baldwin-Kongsberg Co.* Stipulation of dismissal, complaint dismissed with prejudice, Nov. 23, 1970.

3,383,452. (See 3,146,290.)

3,389,236, L. A. Guthart, VIBRATION ACTUATED CONTACT SWITCH, filed Nov. 5, 1970, D.C.N.J. (Newark), Doc. 1485–70, *Alarm Device Manufacturing Co., etc.* v. *On-Guard Corporation of America, Electronic Locator Corp., and Stanley Geller.*

3,401,909, T. L. Kalahar, SUPPORT FIXTURE, filed Jan. 5, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c9, *Thomas L. Kalahar, doing business as Perfix Mfg. Co.* v. *Dur-O-Peg Inc. Industrial Precision Co. and Archie Anders.* Ordered, all proceeding and all claims and counterclaims are dismissed without prejudice, Nov. 13, 1970.

3,435,012. (See 2,895,950.)

3,482,324, J. K. Samhat, COMBINED OPTICAL SIGHT AND CENTER PUNCH, filed Nov. 12, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70–2545–EC, *Jack K. Samhat* v. *Barton Tool & Engineering Co., and David L. Sawyer.*

3,503,082, M. Kerwit, HOSPITAL BED, filed Nov. 9, 1970, D.C., N.D. Tex. (Dallas), Doc. CA–3–4282–C, *Kerwit Medical Products, Inc.* v. *N. & H. Instruments.*

Re. 26,521. (See 3,146,290.)

D. 194,094. (See 3,169,612.)

Certificates of Correction for the Week of Feb. 2, 1971

Re. 26,976	3,525,080	3,535,591	3,539,286
3,370,960	3,526,274	3,535,731	3,539,309
3,454,641	3,527,120	3,536,090	3,539,513
3,459,273	3,527,423	3,536,094	3,539,559
3,472,933	3,528,418	3,536,201	3,539,605
3,487,105	3,528,814	3,536,913	3,539,635
3,488,041	3,531,675	3,537,322	3,539,986
3,489,518	3,532,085	3,537,684	3,540,071
3,491,119	3,532,990	3,537,839	3,540,110
3,492,361	3,533,360	3,537,932	3,540,705
3,509,859	3,533,469	3,538,075	3,541,117
3,511,315	3,534,011	3,538,094	3,541,181
3,513,386	3,534,019	3,538,122	3,541,211
3,516,190	3,534,340	3,538,301	3,541,630
3,517,173	3,535,153	3,538,892	3,541,792
3,520,032	3,535,324	3,539,090	3,542,265
3,523,089	3,535,408	3,539,216	3,542,435
3,524,537			

Disclaimers

3,300,927.—*Phillip Stephen Bettoli,* Martinsville, N.J. LAMINATED SHEET MATERIAL. Patent dated Jan. 31, 1967. Disclaimer filed Dec. 23, 1970, by the assignee, *GAF Corporation.*

Hereby enters this disclaimer to claims 2 and 13 of said patent.

3,511,173.—*Allen E. Morrow,* Portland, Oreg. APPARATUS FOR PRESSING AND STRAPPING LUMBER. Patent dated May 12, 1970. Disclaimer filed Dec. 23, 1970, by the assignee, *Mac-Fab Manufacturing, Inc.*

Hereby enters this disclaimer to claim 18 of said patent.

Lapsed Patents

The following patents have lapsed under the provisions of 35 U.S.C. 151 for failure of payment of remaining balances of issue fees due therein.

3,495,248 issued Feb. 10, 1970
3,499,131 issued Mar. 3, 1970

Plant Variety Protection

German Protection for Kentucky Bluegrass and Roses

Printed below is a translation of the pertinent portion of the official Federal Republic of Germany "Announcement Governing Protection Equivalent to Varietal Protection Outside the Area Where the Breeders' Rights Act Applies" (Bundesgesetzblatt p. 1123/1970) dated July 17, 1970.

This announcement, together with Article 23, paragraph 1(3) of the West German Breeders' Rights Act of May 20, 1968, permits United States nationals to apply for the grant of plant variety protection in the Federal Republic of Germany on new varieties of Kentucky bluegrass and roses.

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

ANNOUNCEMENT GOVERNING PROTECTION EQUIVALENT TO VARIETAL PROTECTION OUTSIDE THE AREA WHERE THE BREEDERS' RIGHTS ACT APPLIES DATED JULY 17, 1970

The Federal Minister for Food, Agriculture and Forestry announces in accordance with Section 23, paragraph 1(3) of the Breeders' Rights Act of May 20, 1968 (Bundesgesetzblatt I p. 439) that protection equivalent to protection under the Breeders' Rights Act is granted German Citizens or persons with residence or place of business in the area where the Act applies for varieties of the following species:

* * * * *

Kentucky Bluegrass—*Poa pratensis* L.
Rose—*Rosa* L. hort.
in the United States of America

Bonn, July 17, 1970.

The Federal Minister for Food, Agriculture and Forestry.

Erratum

All references to Patent No. 3,554,965 to Dwain R. Chapman, Carborane-Siloxane Polymers, appearing in the OFFICIAL GAZETTE of January 12, 1971 should be deleted as the application was withdrawn from issue and the patent was not issued.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 26, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-08-69
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Staroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-01-69
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-09-69
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director... Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	11-03-69
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director.. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-29-69
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	3-18-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-16-69
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-24-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-17-69
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	9-29-69
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	5-01-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	12-01-69
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	9-04-69
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	10-02-69
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	1-29-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	12-04-69

Expiration of patents: The patents within the range of numbers indicated below expire during February, 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,667,637 to 2,670,467 inclusive
Plant Patents	Numbers 1,248 to 1,259, inclusive

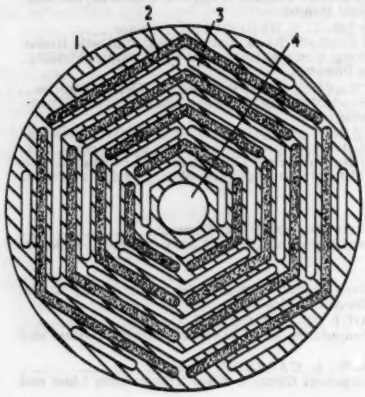
DEFENSIVE PUBLICATIONS

PUBLISHED FEBRUARY 2, 1971

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T883,001
CORE STRUCTURES FOR NUCLEAR REACTORS
Donald Stanley Pettinger, Radbroke Hall, Knutsford, England
Filed Feb. 19, 1969, Ser. No. 800,680
Int. Cl. G21c *5/00*
U.S. Cl. 176—84
5 Sheets Drawing. 4 Pages Specification

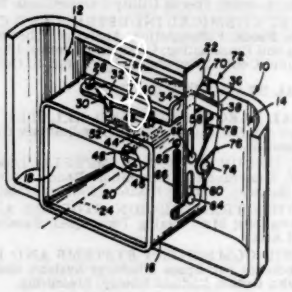


A graphite block for use in a nuclear reactor, wherein passages are formed in the block for the passage of cooling fluid, or for containing nuclear fuel, or for both purposes, at least some of the sides of each passage being flat or straight to define passages of triangular, rectangular or polygonal cross-section. The passages may be formed by using mortise chain cutting gear.

T883,002
ELECTROLYTIC RECORDING MEDIUM
Derek D. Chapman and Dorothy J. Beavers, Rochester, N.Y. (both of Kodak Park Works, Rochester, N.Y. 14650)
Filed July 22, 1969, Ser. No. 843,808
Int. Cl. B21h *1/20*
U.S. Cl. 204—2
No Drawing. 13 Pages Specification

This invention relates to an improved electrolytic recording medium including an electrically conducting support having a hydrophilic surface into which is imbibed an electrosensitive agent, the improvement being that the hydrophilic surface is a hydrophilic colloid layer such as gelatin in which is dispersed a pigment such as barium sulfate. The pigment is dispersed in the hydrophilic colloid in an amount of from, for example, 3 to 12 parts by weight per part of hydrophilic colloid. This inclusion of a hydrophilic colloid surface layer having a pigment dispersed therein promotes image sharpness, fosters image dimensional stability over a period of time and contributes to the preservation of the initial image density.

T883,003
CAMERA WITH FILM METERING AND DOUBLE EXPOSURE PREVENTION MECHANISM
Hubert Nerwin, 901 Elmgrove Road, Rochester, N.Y. 14650
Filed Aug. 22, 1969, Ser. No. 852,405
Int. Cl. G03b *1/62*
U.S. Cl. 95—31
3 Sheets Drawing. 8 Pages Specification



A camera is described having a film metering and double exposure prevention mechanism. The camera is adapted to receive roll film having a plurality of exposure areas and a series of perforations for locating the exposure areas. A film advance mechanism includes a film drive member to which is coupled a ratchet wheel. A pawl is carried by a pivoted lever and is movable into and out of locking engagement with the ratchet wheel to selectively prevent film advance. The lever is biased toward its film advance locking position, but is normally held away from that position by contact between a film sensing finger and film in the camera. The lever is released to move the pawl into locking engagement with the ratchet wheel when a perforation in the film aligns with the finger. The lever extends under a cam surface on a shutter release member so that upon depression of the shutter release member the pawl is moved from engagement with the ratchet and the finger is withdrawn from the perforation to permit film advance until the next perforation aligns with the finger. Double exposure is prevented by a latch member pivotally connected to the shutter release member. The latch member is positioned to overlie the lever when the lever is positioned to permit film advance, thereby preventing depression of the shutter release member. When the film advance mechanism is locked, the latch member clears the lever during shutter release member movement to permit the taking of a picture.

T883,004
PRODUCTION OF LAMINATES

Denis James Henry Sandiford and Alan George Smith, Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England, a corporation of Great Britain

Filed Oct. 27, 1969, Ser. No. 869,859
Claims priority, application Great Britain, Nov. 6, 1968. 52,658/68
Int. Cl. B29d *27/04*
U.S. Cl. 264—45
No Drawing. 10 Pages Specification

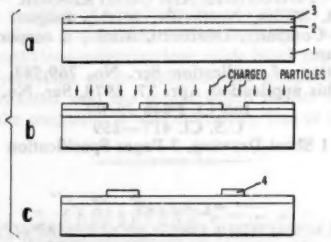
A laminate of synthetic polymeric materials is produced by an injection molding process wherein the first layer of the laminate is injected into a mold through a first sprue. The first injection is permitted to cool to be sufficiently self-supporting to prevent the material of the first injection from blocking the second injection. The mold cavity is subsequently enlarged, and a second amount of polymeric material is injected into the mold through a second sprue extending through the first layer formed by the first injection.

The two layers may be of the same or different polymeric materials, and may be thermoplastic or thermosetting. Fillers may also be present in the polymeric material. One of the layers, preferably the second, may be a foamable composition. Laminates produced according to the process are useful in the production of large area moldings, such as door panels, interior trim panels of automobiles, and any application in which a smooth surface attached to a bulky backing is required.

T883,005
METHOD FOR PRODUCING DIMENSIONALLY STABLE PHOTOSENSITIVE RESIST PATTERN

Max J. Schuller, 917 Sycamore Drive, Palo Alto, Calif. 94303; Michael J. Urban, 27 London Lane, Stamford, Conn. 06902; and Erwin Littau, 75 Grand View Ave., Norwalk, Conn. 06850

Continuation of application Ser. No. 525,018, Feb. 4, 1966. This application Nov. 6, 1969, Ser. No. 871,540
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.2
1 Sheet Drawing. 4 Pages Specification



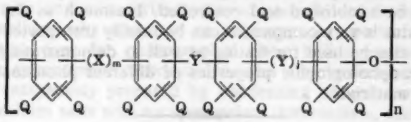
A method for depositing thin film electrical elements of closely controlled dimensions onto a substrate wherein a coating of a photosensitive resinous resist (KTFR) is applied to the surface of the substrate; selected areas of the resist are exposed to light; the unexposed areas of the resist are removed by developing; remaining resist pattern is subjected to a bombardment of electrically charged particles from a glow discharge initiated by an impressed potential of from 800 to 2,000 volts to stabilize the dimensions of the photosensitive resist pattern; and thin film elements are deposited at elevated temperatures to areas from which the resist has been removed.

T883,006
POLYARYLENE ETHER IONOMERS

Derek Morris Holt Waring, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Filed Dec. 15, 1969, Ser. No. 885,302
Int. Cl. C08g *23/00, 23/16*
U.S. Cl. 260—49
No Drawing. 9 Pages Specification

The composition having the recurring unit



wherein the X, Y and O linkages to the phenylene radicals are in the meta or para positions on the phenylene radicals; *n* is at least 25; *m* and *j* are 1 or 0; X and Y are —O—, —S—, —CO—, —SO_2—, —CRR'—

in which R is hydrogen, non-ionic aliphatic, cycloaliphatic, or aromatic hydrocarbon radicals or aliphatic, cycloaliphatic or aromatic hydrocarbon radicals substituted with at least one of the following: —CO_2Z_g, —NWW'W''W'''A_g, —SO_3Z_g, and —PWW'W''W'''A_g, and in which R' is R or —CO_2Z_g, —NWW'W''W'''A_g, —SO_3Z_g, or —PWW'W''W'''A_g,

or —POAr— in which Ar is either a non-ionic aromatic hydrocarbon radical or is an aromatic hydrocarbon radical substituted with at least one of

—CO_2Z_g, —NWW'W''W'''A_g

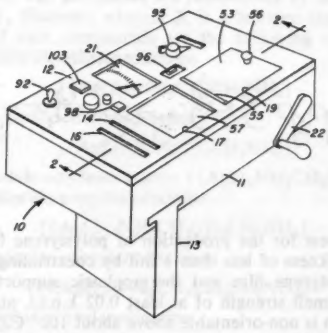
—SO_3Z_g, and —PWW'W''W'''A_g

W, W', W'', and W''' are hydrogen, non-ionic aliphatic, cycloaliphatic or aromatic hydrocarbon radicals; Z is a cation; A is an anion; Q may differ within and among the phenylene radicals and is R' or a halogen; and *g* is ½ or 1.

T883,007
ELECTROPHOTOGRAPHIC APPARATUS

Ivan B. Ville, 2000 Lake Ave, Rochester, N.Y. 14650; James D. Walling, 78 Pinewoods Ave., Troy, N.Y. 12180; and Dale L. Smith, 2000 Lake Ave., Rochester, N.Y. 14650

Filed Feb. 5, 1970, Ser. No. 8,908
Int. Cl. G03g *15/00, 15/22*
U.S. Cl. 355—12
3 Sheets Drawing. 6 Pages Specification



An electrophotographic apparatus in which unit magnification duplication of positive or negative transparent

originals can be made on a material comprising a transparent support having a layer of a photoconductive material. The apparatus comprises means for uniformly charging the layer of photoconductive material, imagewise exposing the layer of photoconductive material through the original by means of ambient light, and liquid developing the latent electrostatic image. The charge placed on the photoconductive material is measured by an electrometer which visually displays, on a meter, the measured charge on the photoconductive material. Thus, the sufficiency of the charge as well as the exposure time can be established and controlled. Inasmuch as the apparatus is very compact, it can be readily transported and can also be used for testing as well as demonstrating the electrophotographic properties of different photoconductive materials.

T883,008
NOVEL COMPOSITION OF MATTER 1,2,4-TRIS (PHENOXY) BENZENE

Gether Irick, Jr., Lloyd P. Foster, Jr., and Robert W. Kennedy, all of P.O. Box 511, Kingsport, Tenn. 37662

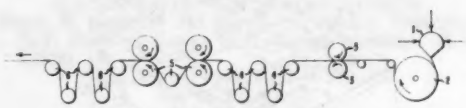
Continuation of application Ser. No. 701,565, Jan. 30, 1968. This application Mar. 19, 1970, Ser. No. 19,536
Int. Cl. C07c *43/22*
U.S. Cl. 260—613
No Drawing. 9 Pages Specification

A new polyphenyl ether, 1,2,4-tris(phenoxy)benzene is disclosed which possesses definite advantages such as oxidative stability and low melting point, making it an excellent high temperature heat transfer agent, lubricant, hydraulic fluid, diffusion pump oil and specialty processing fluid. The ratio of cross section of a molecule of 1,2,4-tris(phenoxy)benzene to length is relatively low, resulting in a good viscosity-temperature relationship. A good viscosity-temperature relationship is needed to provide as constant a viscosity as possible over a wide temperature range, thereby facilitating easy equipment design in regard to flow, lubricity, etc. The compound may also be blended with linear polyphenyl ethers to improve the properties thereof.

T883,009
PROCESS FOR THE MANUFACTURE OF THIN GAGE POLYSTYRENE FILMS

Max Goldman, 23 Batavia Drive, Williamsville, N.Y. 14221

Continuation of abandoned application Ser. No. 735,456, June 7, 1968. This application Mar. 23, 1970, Ser. No. 20,450
Int. Cl. B29f *3/10*; C08f *7/02*; D01d *5/12*
U.S. Cl. 264—166
1 Sheet Drawing. 11 Pages Specification

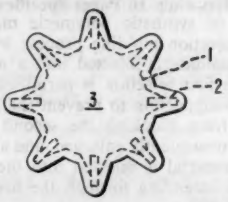


A process for the production of polystyrene film having a thickness of less than 1 mil by coextruding at least one polystyrene film and thermoplastic supporting film having a melt strength of at least 0.02 k.p.s.i. at 100° C. and which is non-orientable above about 100° C.; quenching the resulting structure; molecularly orienting the polystyrene at a temperature of about from 100° to 125° C. and separating the films of the structure. Preferred support films include branched polyethylenes.

T883,010
PROTECTIVE CAP FOR OUTBOARD EDGES OF BREAKER BAR ON BREAKER ROLLS

Charles A. Amos, Waynesboro, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Filed Apr. 8, 1970, Ser. No. 26,502
Int. Cl. D01g *1/08*
U.S. Cl. 19—.37
1 Sheet Drawing. 4 Pages Specification

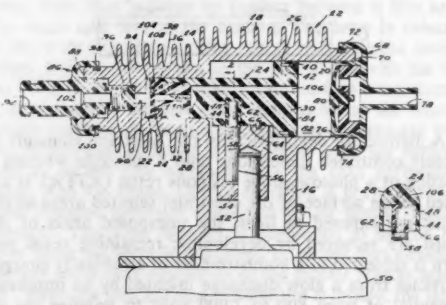


A protective cap is provided as an improvement to an apparatus for stretch-breaking synthetic tows. This apparatus includes a breaker means which comprises a pair of cantilevered shafts, breaker rolls formed at the outboard ends of said shafts and a plurality of substantially flat breaker bars radially aligned on said breaker rolls. The breaker rolls are mounted in such a manner that when rotated in opposite directions, the breaker bars of one roll interdigitate to a controllable depth with the breaker bars of the other roll. The protective cap, identified by the numeral 3 in the drawing, fits snugly over at least about ¼ inch of the outboard edges of the breaker bars of one of said breaker rolls. The cap protects the ceramic breaker bars against chipping when taut multifilament tows are inserted therebetween. Since only those circumferential forces which are applied to the outer ¼ inch of the breaker bars is likely to lead to chipping and breaking, it is preferred that the protective cap fit snugly over the outboard ¼ inch of the edges of the breaker bars. Alternatively, the protective cap can be attached to the outboard end of one of said breaker rolls. It is preferred that the protective cap be formed from a thin sheet metal.

T883,011
TWO-STAGE AIR COMPRESSOR

Gerald R. Miller, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

Continuation of application Ser. No. 769,582, Oct. 22, 1968. This application Apr. 27, 1970, Ser. No. 29,756
Int. Cl. F04b *25/00*
U.S. Cl. 417—259
1 Sheet Drawing. 7 Pages Specification



A two-stage air compressor having a stepped diameter reciprocating piston. A first compression chamber is sep-

arated from a second compression chamber by a passageway and check valve formed within the stepped diameter piston.

T883,012

PROCESS FOR COAGULATING A LATEX OF AN ELASTOMER POLYMER

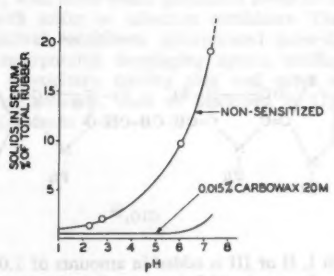
Ernst Schmidt and John H. Williams, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio, a corporation of Ohio

Continuation of application Ser. No. 663,758, Aug. 28, 1967. This application May 1, 1970, Ser. No. 31,860

Int. Cl. C08d *5/04*; C08f *1/92*

U.S. Cl. 260—85.1

1 Sheet Drawing. 9 Pages Specification



A latex of polybutadiene, polyisoprene, butadiene-styrene copolymer, butadiene-isoprene copolymer, butyl rubber, EPM rubber, EPDM rubber or an aqueous dispersion of reclaimed natural or synthetic rubber, stabilized with an acid-sensitive stabilizer, is coagulated usually at 130° to 140° F. by admixing an acid and/salt, e.g. sulfuric, acetic, formic or hydrochloric acid, aluminum sulfate, sodium chloride, zinc acetate, zinc chloride, zinc sulfate or sodium sulfate, to a pH of 2 to 7.5, and preferably 4 to 7.5. Before the coagulant is added there is added to the latex a sensitizing agent such as (1) the reaction product of a polyalkylene oxide and a coupling agent such as a diepoxide, a diamine or a diisocyanate, (2) polyethylene-polypropylene oxide block copolymer or (3) polyethylene oxide. Substantially complete coagulation is effected, and the serum which results on separation of the coagulum is almost entirely free of elastomer.

T883,013

RETOUCHING COLORED PHOTOGRAPHIC PICTURES

Arthur D. Kuh, Penfield, N.Y.
(1669 Lake Ave., Rochester, N.Y. 14650)

Filed May 27, 1970, Ser. No. 41,102

Int. Cl. G03c *7/00*

U.S. Cl. 96—56

No Drawing. 6 Pages Specification

Colored photographic images obtained in multilayer color films by color-forming development are retouched to reduce the cyan dye density by treatment of the colored images with a mixture of a 5-pyrazolone coupler and a competing coupler such as a naphthol sulfonic acid, to uncouple some of the cyan dye and form a soluble dye washing out of the film.

T883,014

SILVER HALIDE EMULSIONS CONTAINING IMIDAZOLIUM SPECTRAL SENSITIZING DYES

Donald W. Heseltine, 22 Edgewater Lane, and Leslie G. S. Brooker, 915 Winona Blvd., both of Rochester, N.Y. 14617

Filed June 1, 1970, Ser. No. 42,534

Int. Cl. G03c *1/08, 1/10*

U.S. Cl. 96—131

No Drawing. 27 Pages Specification

Novel dyes of the carbocyanine, dicarbocyanine, merocyanine and merocarbocyanine classes derived from imidazolium salts are used to advantage as spectral sensitizing dyes for photographic silver halide emulsions. Our symmetrical carbocyanines and dicarbocyanines are advantageously prepared by condensing one of our imidazolium salts with an appropriate intermediate, such as, diethoxymethyl acetate, ethyl orthoformate, ethyl orthoacetate, ethyl orthopropionate, trimethoxypropene, β-anilinoacrolein anil hydrochloride; our unsymmetrical carbocyanines and dicarbocyanine dyes are advantageously prepared by condensing our imidazolium salts with intermediates having any of the 5- to 6-membered basic heterocyclic nuclei, e.g., a thiazole, a benzothiazole, a naphthothiazole, a thianaphtheno-7',6',4,5-thiazole, an oxazole, a benzoxazole, a naphthoxazole, a selenazole, a benzoselenazole, a naphthoselenazole, a thiazoline, a pyridine, a quinoline, an isoquinoline, a 3,3-dialkylindolenine, a benzimidazole, a naphthimidazole, etc. used in cyanine-type dyes while the merocyanine and merocarbocyanine dyes are advantageously prepared by condensing our imidazolium salts with any of the intermediates containing 4- to 6-membered heterocyclic ketomethylene nuclei, e.g., a 3-thietanone-1,1-dioxide, a 2-thio-2,4-thiazolidinedione, a rhodanine, a 2-thiobarbituric acid, a barbituric acid, a 2-thiohydantoin, a hydantoin, a 2-thio-2,4-oxazolidinedione, a 2-thiazolin-4-one, a 2-pyrazolin-5-one, a 2-imidazolin-4-one, a 2-imidazolin-4-thione, a 2-imidazolin-4-selenone, etc used to make merocyanine-type dyes.

T883,015

SILVER HALIDE PRINTOUT PHOTOGRAPHIC MATERIALS

Robert D. Lindholm, Kodak Park Works, Rochester, N.Y. 14650

Filed June 1, 1970, Ser. No. 42,594

Int. Cl. G03c *1/02*

U.S. Cl. 96—114.6

No Drawing. 9 Pages Specification

There are disclosed photographic emulsions containing silver halide-diamine complexes. Radiation-sensitive papers of the print-out type coated with such complexes are also disclosed. The complexes are represented by the formula [$(AgX)_2$ diamine] wherein X is a halogen atom. Exemplary of such compounds are the following complexes: silver chloride-ethylenediamine

$$[(AgCl)_2NH_2CH_2CH_2NH_2]$$

silver bromide-ethylenediamine

$$[(AgBr)_2NH_2CH_2CH_2NH_2]$$

silver iodide-ethylenediamine $[(AgI)_2NH_2CH_2CH_2NH_2]$; silver chloride-propylenediamine

$$[(AgCl)_2NH_2CH_2CH_2CH_2NH_2]$$

silver bromide-propylenediamine

$$[(AgBr)_2NH_2CH_2CH_2CH_2NH_2]$$

silver iodide-propylenediamine

$$[(AgI)_2NH_2CH_2CH_2CH_2NH_2]$$

Effective complexes include the silver halide-alkylene diamines such as silver halide-ethylenediamine, silver ha-

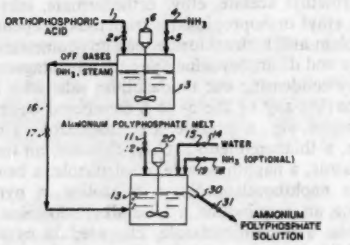
lide - propylenediamine, silver halide - tetramethylenediamine, silver halide-pentamethylenediamine, silver halide-hexamethylenediamine, etc.

T883,016
PRODUCTION OF AMMONIUM POLYPHOSPHATE SOLUTION

John M. Potts, Florence, Ala., assignor to Tennessee Valley Authority, a corporation of the United States

Substituated for abandoned application Ser. No. 542,779, Aug. 15, 1966. This application June 11, 1970, Ser. No. 45,475

Int. Cl. C05b 7/00, 21/00
U.S. Cl. 71—34
2 Sheets Drawing. 19 Pages Specification



DIRECT PRODUCTION OF AMMONIUM POLYPHOSPHATE SOLUTION FROM ORTHOPHOSPHORIC ACID

A method for producing improved high-analysis ammonium polyphosphate fertilizer solutions or suspensions directly from orthophosphoric acid and anhydrous ammonia by simultaneously introducing into a vessel said orthophosphoric acid and said anhydrous ammonia; maintaining in the vessel a resulting melt of ammonium polyphosphates; continuously agitating the melt of ammonium polyphosphate and causing the intimate mixing of the incoming streams of orthophosphoric acid and anhydrous ammonia with the melt; withdrawing from the vessel a portion of the melt of ammonium polyphosphates and introducing it into a solution tank, together with a stream of aqueous medium; simultaneously introducing into the solution tank the off gases from the vessel consisting of steam and unreacted ammonia; continuously agitating the resulting fertilizer solution or suspension in the solution tank; and withdrawing a portion of the resulting solution or suspension as product, said product characterized by the fact that it contains, in addition to ammonium orthophosphate, substantial portions of ammonium pyrophosphate, ammonium tripolyphosphate, and ammonium polyphosphates more highly condensed than ammonium tripolyphosphate.

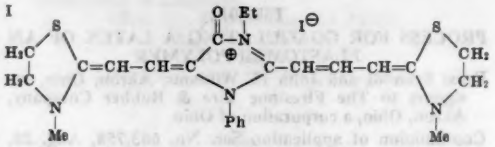
T883,017
PHOTOGRAPHIC SILVER HALIDE MATERIALS CONTAINING CYANINE DYES AS CHEMICAL SENSITIZERS

Cynthia Geer Ulbing, Kodak Park Works, 1669 Lake Ave., Rochester, N.Y. 14650

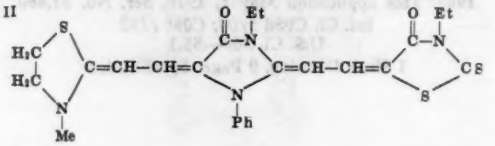
Filed June 29, 1970, Ser. No. 51,021
Int. Cl. G03c 1/28
U.S. Cl. 96—107
No Drawing. 20 Pages Specification

Low concentrations of certain quaterned trinuclear complex cyanine I, trinuclear complex merocyanine II and quaternated tetranuclear complex cyanine dyes III chemically sensitize fine grain silver halide photographic emulsions having an average grain size less than about 0.3 micron. The effect is obtained with concentrations of the dyes well below the effective spectral sensitizing concentrations, e.g., of the order of 0.1 to 25 mg. of dye per mole of silver halide. Examples of the dyes include:

I

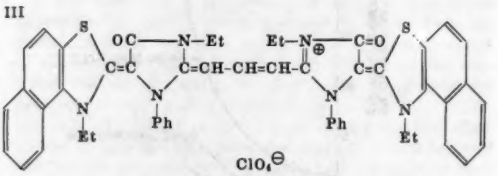


II



and

III



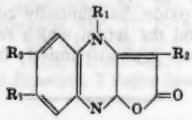
When I, II or III is added in amounts of 1.0 mg./mole Ag to a fine grain (0.2μ) cubic silver bromoiodide gelatin emulsion which is gold and sulfur sensitized and the emulsion is coated on cellulose acetate film support at 400 mg. Ag/ft.^{2} and 400 mg. gelatin/ft.^{2}, an increase in blue speed without substantial spectral sensitization is observed.

T883,018
OPTICAL BRIGHTENING AGENTS

Derek D. Chapman and John W. Gates, Jr., both of Kodak Park Division, Rochester, N.Y. 14650

Filed July 9, 1970, Ser. No. 53,701
Int. Cl. G03c 1/92
U.S. Cl. 96—82
No Drawing. 15 Pages Specification

Compounds having the structure:



wherein each of R_1 and R_3 can be hydrogen; alkyl, including substituted alkyl; aryl, including substituted aryl, and R_2 is halogen; alkyl, including substituted alkyl; aryl, including substituted aryl, have been found to be optical brighteners, especially for photographic elements, for example, a photographic element comprising a photographic silver halide layer, photographic print materials and particularly for photographic color print materials. The brighteners are inert photographically and may be used without any deleterious effect in photographic silver halide emulsion layers, Baryta layers, backings, undercoats and other layers where the compounds can be employed advantageously. The brighteners may be dissolved in a dispersing solvent prior to incorporation into the photographic element. The brighteners can be present in a photographic layer in an amount of from about 2 to 10 mg.

per square foot of surface. Although the optical brighteners of the invention have particular applicability to photographic elements, their use is not limited thereto. They may also be used, for instance, in lighting panels; in various types of plastic compositions, in inks, paints, and the like or in any application applied to a surface or in a film for the emission of visible light upon exposure to ultraviolet light.

Illustrative compounds useful as optical brighteners in accordance with the present invention are:

3-methylfuro(2,3-b)quinoxalin-2(4H)-one
3-phenylfuro(2,3-b)quinoxaline-2(4H)-one
3-methyl-4-n-octyl-furo(2,3-b)-2(4H)-one
3-methyl-4-n-octadecylfuro(2,3-b)quinoxalin-2(4H)-one
3-decylfuro(2,3-b)quinoxalin-2(4H)-one
2-methyl-3-decylfuro(2,3-b)quinoxalin-2(4H)-one.

The photographic silver halide emulsions and elements containing the optical brighteners can be chemically sensitized, e.g., with noble metal sensitizers alone or in combination with sulfur or selenium sensitizers. They can contain spectral sensitizers, incorporated color-forming couplers, incorporated developing agents, antifoggants, hardeners, plasticizers, coating aids, and other suitable photographic addenda, such as described in U.S. Pat. 3,297,446 (columns 4–9).

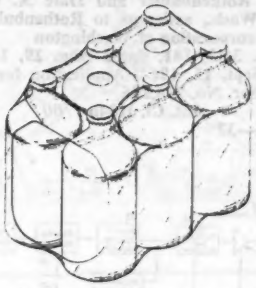
T883,019

BOTTLE PACKAGE OR SIMILAR ARTICLE

Joseph Daniel Greenwell, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Continuation of design application Ser. No. 14,124, Oct. 23, 1968. This application Feb. 27, 1970, Ser. No. 21,666

Int. Cl. D9—99
U.S. Cl. D9—176
2 Sheets Drawing. 3 Pages Specification



The design relates to a bottle package or similar article, substantially as shown.

REISSUES

FEBRUARY 2, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

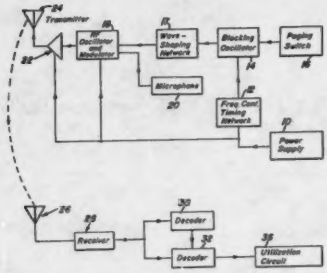
27,044
TWO-TONE REMOTE CONTROL SYSTEM

Howard E. Rothenbuhler and Dale A. Crowe, Sedro Woolley, Wash., assignors to Rothenbuhler Engineering Co., a corporation of Washington

Original No. 3,339,141, dated Aug. 29, 1967, Ser. No. 395,680, Sept. 11, 1964. Application for reissue Nov. 18, 1968, Ser. No. 794,826

Int. Cl. H04b *1/00*

U.S. Cl. 325—37 **12 Claims**



A system is disclosed for controlling the blowing of a whistle employed in logging operations from a distance by radio control. A transmitter sends and a receiver responds to a carrier frequency modulated by a burst of a first audio frequency tone of limited duration followed immediately by a second audio frequency tone modulation of indefinite duration. The burst of first frequency modulation is sufficiently short that receivers of conventional single tone modulation systems will not respond.

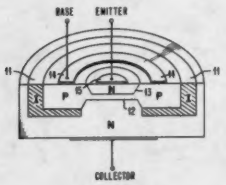
27,045
TRANSISTOR WITH LIMITED AREA BASE-COLLECTOR JUNCTION

Hwa N. Yu, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, New York, N.Y., a corporation of New York

Original No. 3,312,881, dated Apr. 4, 1967, Ser. No. 322,383, Nov. 8, 1963. Application for reissue Jan. 15, 1969, Ser. No. 796,638

Int. Cl. H01l *5/00, 11/00, 11/08*

U.S. Cl. 317—235 **9 Claims**



A transistor device is disclosed wherein its collector region forms a junction of limited extent with the base region and an intrinsic or high resistivity region of the same conductivity type as the collector region extends from the extremity of the junction to the surface of the device. The emitter is located within the base region and in spaced alignment with the junction of limited extent.

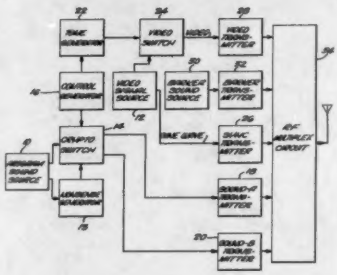
27,046
SUBSCRIPTION TELEVISION SYSTEM

Phil H. Weiss, deceased, late of Van Nuys, Los Angeles, Calif., by Mildred L. Weis, administratrix, Van Nuys, Los Angeles, and Abraham M. Reiter, Reseda, Los Angeles, Calif., assignors, by mesne assignments, to Paramount Pictures Corporation, New York, N.Y., a corporation of New York

Original No. 3,001,011, dated Sept. 19, 1961, Ser. No. 742,114, June 16, 1958. Application for reissue Aug. 23, 1962, Ser. No. 219,375

Int. Cl. H04n *7/16*

U.S. Cl. 178—5.1 **20 Claims**



A subscription television system provides security by replacing horizontal blanking and synchronizing pulses with a signal having a grey level amplitude. A reconstituting signal is generated having the frequency of horizontal synchronizing pulses, and is transmitted on a separate carrier. Program audio and nonsense audio are randomly alternately transmitted over two audio channels. Control tone signals are transmitted which are indicative of program price and audio signal switching intervals. The receiver includes an attachment which may include a coin box, selector switches for establishing a decoder pattern, and a cyclic counter which advances in step with the transmitted control signals. Logic circuitry determines whether proper control settings have been made at the receiver. With proper settings and payment of the proper amount of money, the attachment applies the received reconstituting signal to a rectangular pulse generator to derive pulses for increasing the gain of an RF amplifier to which the composite video is applied, providing a normal composite signal to the receiver.

27,047
DIGITAL ADAPTIVE EQUALIZER SYSTEM

Robert W. Lucky, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, New York, N.Y., a corporation of New York

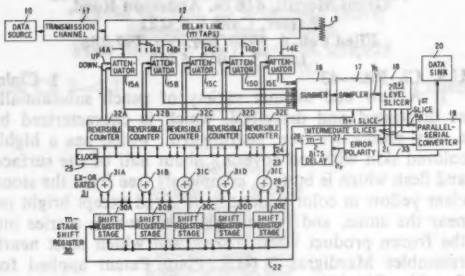
Original No. 3,414,819, dated Dec. 3, 1968, Ser. No. 483,129, Aug. 27, 1965. Application for reissue Sept. 8, 1969, Ser. No. 862,989

Int. Cl. H04b *3/04, 3/14*

U.S. Cl. 325—42 **13 Claims**

An adaptive transversal equalizer system for multilevel digital data in which attenuators connected to equally

spaced taps therealong are incrementally adjusted according to a correlation of the polarity of each received data symbol with an error polarity component to minimize intersymbol interference. The error polarity component is obtained from the difference between the actual



level of each received signal sample and the normalized digital encoding level assigned thereto. For smoothing purposes correlation results are averaged in reversible digital counters and tape attenuators are adjusted only upon overflow of such counters.

27,048

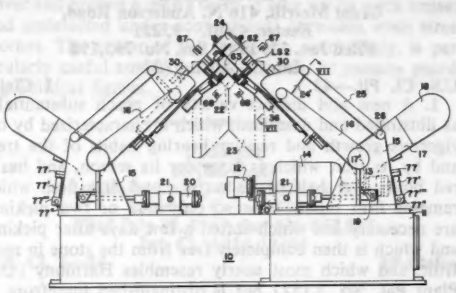
AUTOMATIC BILLET SCANNING APPARATUS

John S. Miller, Poland, and John A. Toth, Highland Heights, Ohio, assignors, by mesne assignments, to Republic Steel Corporation, Cleveland, Ohio, a corporation of New Jersey

Original No. 3,311,819, dated Mar. 28, 1967, Ser. No. 284,956, June 3, 1963. Application for reissue Mar. 25, 1969, Ser. No. 830,890

Int. Cl. G01r *33/12*

U.S. Cl. 324—37 6 Claims



Billet faces are scanned by apparatus in which a flaw detector, supported for laterally reciprocating movement across a billet face, is carried on a pivoted arm movable by motor means toward and away from the billet. Arm movement is controlled so that the arm approaches a billet first at rapid speed and then at a slower speed and is maintained against the billet under pressure reduced from that used to advance it toward the billet.

PLANT PATENTS

GRANTED FEBRUARY 2, 1971

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,022
PEACH TREE
Grant Merrill, 416 N. Anderson Road, Exeter, Calif. 93221
Filed Jan. 22, 1969, Ser. No. 793,198
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach substantially as illustrated and described, which is characterized by the vigorous growth and regular bearing habits of the tree; and by its fruit which is large for its season, and has a red blush over half of its surface and firm flesh which remains firm on the tree so only one or two pickings are necessary but which soften a few days after picking, and which is then completely free from the stone in most fruit; and which most nearly resembles Harmony (U.S. Plant Pat. No. 2,152) but is distinguished therefrom in that it ripens about one week earlier, has more red in its skin color, and remains firm longer on the tree.

3,023
PEACH TREE
Grant Merrill, 416 N. Anderson Road, Exeter, Calif. 93221
Filed Jan. 29, 1969, Ser. No. 795,127
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach substantially as illustrated and described and which is characterized by a vigorous and productive tree, bearing large size fruit with a skin color which is red over half or more of the surface; which fruit is sufficiently firm to require fewer pickings, and permit machine handling, with less bruising than other peaches of like season, has flesh which is sufficiently free from the stone, and is clear enough in flesh color to make a good freezing peach; and by its resemblance to Angelus (U.S. Plant Pat. 1,966) from which it is distinguished primarily by its greater firmness and more extensive red coloring on the skin.

3,024
PEACH TREE
Grant Merrill, 416 N. Anderson Road, Exeter, Calif. 93221
Filed Feb. 6, 1969, Ser. No. 797,286
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach substantially as illustrated and described, which is characterized by a very productive tree, bearing fruit which has a highly colored skin with red covering about half of the surface, and flesh which is buttery, completely free from the stone, clear yellow in color with very little red except bright red near the stone, and has a high flavor which carries into the frozen product when frozen; and which most nearly resembles Mardigras 2 (U.S. Plant Patent applied for, Ser. No. 730,688, now Plant Pat. No. 2,966) but is an improvement thereon in that the fruit ripens a few days earlier, has less red in the flesh, a higher flavor, and a texture that is more buttery when frozen.

3,025
APPLE TREE
Harold Matson, Zillah, Wash., assignor to Stark Bro's Nurseries & Orchards Company, Louisiana, Mo., a corporation of Missouri
Filed Feb. 26, 1969, Ser. No. 802,692
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—35 **1 Claim**

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a general resemblance of the tree and fruit to the variety "Ryan Red Delicious," a uniform, more stable bright red fruit blush that is completely free of stripes, as distinguished from the prominently striped color pattern of "Ryan Red Delicious," and an earlier fruit coloring habit occurring at least a full month before fruit maturity and being earlier than any other known strain of "Red Delicious" now in commerce, with the fruit developing an extra fancy grade color in early August at Zillah, Wash.

PATENTS

GRANTED FEBRUARY 2, 1971

GENERAL AND MECHANICAL

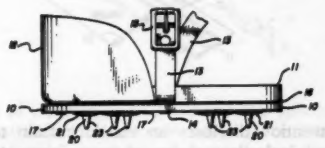
3,559,209
SPACE SUIT PROTECTIVE ASSEMBLY
Edwin G. Vail, 20 Whitcomb Drive, Simsbury, Conn. 06070
Filed Mar. 17, 1967, Ser. No. 624,028
Int. Cl. A62b *17/00*
U.S. Cl. 2—2.1 **6 Claims**

A space suit comprising a helmet formed of an upper and a lower section with a fluid-tight detachable connection in the region of the neck, an upper torso section permanently joined to the lower helmet section and provided with arm coverings, a lower torso section joined to the upper torso section by a detachable fluid-tight zipperlike junction extending horizontally around the rear of the body and converging upwardly in front, the upper torso section being formed of a woven fabric positioned on a bias, the lower torso section being formed of an upper portion of woven fabric and a lower corrugated portion covering the waist and hip joint region, the lower corrugated portion carrying leg coverings, an integrated system of tensile members connecting each arm covering with the lower edge of the lower helmet section and another integrated system of tensile members connecting each leg covering with the junction between the fabric portion and the corrugated portion of the lower torso section.

3,559,210
COMPOSITE CERAMIC BODY ARMOR OR SHIELD
John V. E. Hansen, 11 Pinecrest Drive, Westboro, Mass. 01581
Continuation-in-part of application Ser. No. 737,914, June 18, 1968. This application May 16, 1969, Ser. No. 830,187
Int. Cl. F41h *5/08*
U.S. Cl. 2—2.5 **10 Claims**

Lightweight body armor effective to protect the wearer against close range small arms fire consists of a ceramic plate adhered to a backing element. The armor conforms generally to body shape, and while of adequate size to cover and protect a man's torso, it may yet be worn unseen and undetected under conventional garments, even street clothes. The armor of the invention, accordingly, is particularly useful among political figures, or persons guarding political figures.

3,559,211
KNEE PAD
Art Malisani, Jr., 474 W. Easter Ave., Littleton, Colo. 80120
Filed July 30, 1969, Ser. No. 845,997
Int. Cl. A41d *13/06*
U.S. Cl. 2—24 **10 Claims**



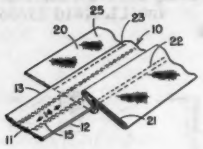
A knee pad for protecting the knees and clothing of workers engaged in laying tile floors or in producing epoxy and other plastic material floors, comprising a sole of moisture resistant material, a cushioning material layer overlying and fastened to the sole, means for holding the pad on the knee of a wearer, a cuff extending upwardly from the front and forward sides of the sole having its lower edge confined between the sole and cushioning layer, and a plurality of spikes or cleats depending from the sole and located in spaced relation adjacent each longitudinal side edge of the sole, with an additional cleat located in the center forward area and another in the center rearward area of the sole, to prevent tipping or sliding of the pad when the wearer shifts his weight sidewise, the location of the cleats being such that the central area of the sole is free of cleats and adapted to conform to the contour of the knee in use.

3,559,212
GOLFING GLOVE
Michael Skovron, 439 W. Arlington Road, Erie, Pa. 16509
Filed June 12, 1969, Ser. No. 832,694
Int. Cl. A41d *19/00*
U.S. Cl. 2—161 **5 Claims**

A golfer's glove for the three finger control in the left hand guiding the club. The fingers of the glove

have Velcro on their outside and an elastic flap having Velcro on both ends is attached to the glove at the base of the thumb and is attachable to the Velcro on the fingers. Thus the fingers may be held in closed grip position and the grip of the fingers controls the golf club.

3,559,213
STRETCHABLE CURTAIN FOR APPLICATION TO OUTER GARMENTS AND GARMENTS CONTAINING THE SAME
Sheldon Goodman, 66 Essex Place, Dumont, N.J. 07628
Continuation-in-part of application Ser. No. 767,108, Oct. 14, 1968. This application May 12, 1969, Ser. No. 823,825
Int. Cl. A41d *1/06*
U.S. Cl. 2—237 **7 Claims**

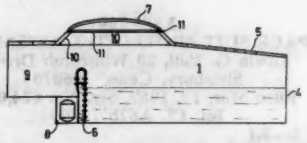


The invention discloses an elastic curtain to replace the normal inelastic curtains of outer garments such as trousers, skirts, shorts, culottes, etc., or to be added to other outer garments where a close fitting comfortable waistline is desired. The elastic curtain comprises a heavy core of elastic strip material with finished edges which strip material is stretchable in one direction and a two-way stretch elastic fabric covering the heavy strip material, or that part of the strip material which is nearest the wearer's body.

3,559,214
COMPOUND PROSTHESIS
William J. Pangman, 865 Comstock Ave. W., Apt. 12A, Los Angeles, Calif. 90024
Filed Oct. 17, 1968, Ser. No. 768,315
Int. Cl. A41c *3/00*; A61f *1/00*
U.S. Cl. 3—36 **9 Claims**

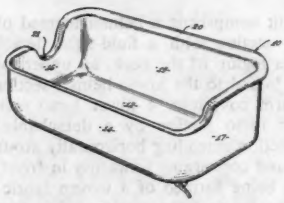
A compound prosthesis for surgical implantation is provided with internal partitions that divide the hollow container into a plurality of internal compartments. Each of the compartments is substantially filled with a soft fluid gel which allows the prosthesis to change shape readily, but the compartmentalization minimizes any visible change in shape due to movements of the wearer.

3,559,215
PREFABRICATED COVERED SWIMMING POOL
Alfred Kormann, 8011 Eglharting, near Munich, Germany
Filed June 9, 1969, Ser. No. 831,385
Int. Cl. E04h *3/16*
U.S. Cl. 4—172.12 **14 Claims**



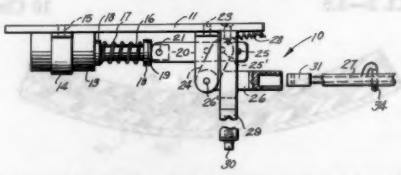
A covered steel shell swimming pool has corrugated sides. A transparent cover has a domed and hinged overhead access over a diving area. A deck is provided at one end of the pool forming an anteroom with high head clearance. The roof slopes downward over the pool area where head clearance is not important.

3,559,216
PORTABLE BATHTUB
Dorothy F. Kyte, 2747 Rimpau, Los Angeles, Calif. 90016
Filed Apr. 15, 1968, Ser. No. 721,502
Int. Cl. E03c *1/18*
U.S. Cl. 4—178 **10 Claims**



A portable bathtub is provided for use on a bed by bed patients. It is designed especially to allow the patient to enter and leave the bathtub with a minimum amount of lifting of the patient, the bathtub resting upon the bed when in use. It is a lightweight portable structure.

3,559,217
AUTOMATIC FLUSHING DEVICE FOR COMMODES
Howard Webster Johnson, 56195 East Ave., Mishawaka, Ind. 46544
Filed Dec. 16, 1968, Ser. No. 783,829
Int. Cl. E03d *5/00*
U.S. Cl. 4—67 **4 Claims**

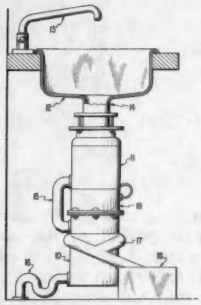


An apparatus for automatically flushing toilet commodes having a solenoid and associated linkage that is

actuated by a control electric cell or other switching devices.

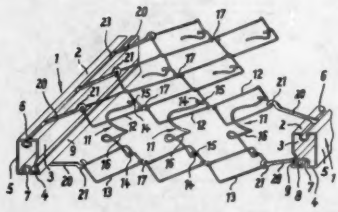
3,559,218
SLUDGE EXTRACTOR FOR HOME WASTE DISPOSALS
Stephen Hopkins, Glenn Echo Heights, Md., assignor to Hopkins Science and Research Corporation, Washington, D.C.
Filed June 26, 1968, Ser. No. 740,274
Int. Cl. B02c *18/42*
U.S. Cl. 4—187 9 Claims

A centrifuge extractor for use with a waste disposal, such as might be used in a home, to remove sludge from the disposal discharged to the drainage system. The extractor unit is provided with compact arrangement for placement along with such a waste disposal beneath a



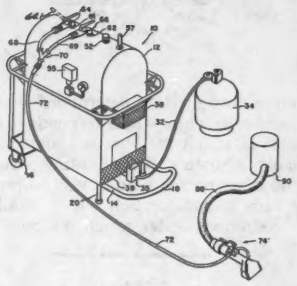
kitchen sink and is adapted to retain sludge particles above a minimum size without incurring clogging of the extractor unit.

3,559,219
BED FRAME WITH A BUILT-IN SPRING CORE
Otto P. Molt, Haubersbronn, Wurttemberg, Germany
Filed Dec. 26, 1968, Ser. No. 787,028
Claims priority, application Germany, Dec. 28, 1967, P 16 54 321.8
Int. Cl. A47c *23/02, 23/04*
U.S. Cl. 5—247 11 Claims



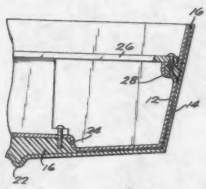
This invention is directed to bed frame with a built-in spring core. The spring core is constructed from elastic springs connected to each other at their corners. Tension members of elastic material act to brace the elastic springs against the bed frame, the tension members being provided with hooks at one end and anchoring elements at their other end. The tension members are connected at one end to the springs by means of the hooks, and are secured to the bed frame by the anchoring elements which are inserted into anchoring grooves provided in the bed frame.

3,559,220
PORTABLE RUG DYEING MACHINE AND METHOD
John A. Thompson, Portland, Oreg., and William H. Wisdom, Portland, Oreg. (Rte. 2, Box 178E, Sherwood, Oreg. 97140); said Thompson assignor to said Wisdom
Application Mar. 29, 1968, Ser. No. 723,325, which is a continuation of abandoned application Ser. No. 344,085, Feb. 11, 1964. Divided and this application May 29, 1968, Ser. No. 751,634
Int. Cl. B08b *3/00, 5/04*
U.S. Cl. 8—149.1 6 Claims



Method of cleaning and/or dyeing rugs, upholstery and the like materials while the same are in place. Incremental strip of material instantaneously beneath a moving nozzle is first sprayed with heated cleansing or dyeing fluid, the exposed to a vacuum to prevent excessive wetting.

3,559,221
MULTILAYER HULL FOR A SMALL BOAT
Paul B. Juhnke, Rte. 2, Box 228, East Troy, Wis. 53120
Filed Jan. 11, 1968, Ser. No. 697,094
Int. Cl. B32b *15/20*; B63b *3/12, 3/20*
U.S. Cl. 9—6 1 Claim

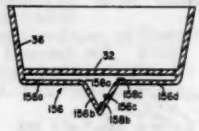


This disclosure comprises a panel, shell, hull of a boat, or other formed shape which consists of outer and inner thin sheets of aluminum bonded together and made rigid by an internal layer of epoxy or other resinous cement.

3,559,222
BOAT WITH ADJUSTABLE BOTTOM
Harold L. Walker, Whitestone, N.Y., assignor to Albert C. Nolte, Jr., New York, N.Y., a fractional part interest
Continuation-in-part of application Ser. No. 650,955, July 3, 1967. This appplication Oct. 28, 1968, Ser. No. 795,369
Int. Cl. B63b *3/00, 5/00*
U.S. Cl. 9—6 25 Claims

A boat which has a deck situated between a pair of sides of the hull, these sides extending downwardly below the deck where the sides respectively have bottom edges. The

hull includes a bottom wall connected to these bottom edges to be carried by the sides of the hull, and this bottom wall of the hull is adjustable so that it can assume a number of different configurations. These configurations can include a range from a substantially flat configuration to a V-shaped configuration. An adjusting structure is connected to the bottom wall to adjust the latter so that it

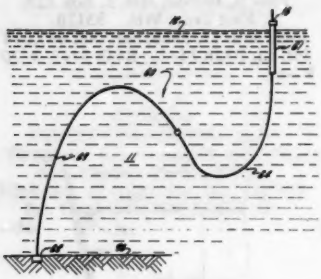


will assume a configuration determined by the adjusting structure, and a structure which responds to the condition of the water in which the boat is situated is capable of automatically actuating the adjusting structure to act through the latter on the bottom wall to provide it automatically with a configuration which is adapted to the particular conditions under which the boat is operated.

3,559,223
LONG SPAR BUOY CONSTRUCTION AND MOORING METHOD

George S. Lockwood, Jr., and Robert K. Atwater, Los Angeles, Calif., assignors to Global Marine Inc., Los Angeles, Calif.

Continuation of application Ser. No. 548,566, May 9, 1966. This application July 30, 1969, Ser. No. 863,402
Int. Cl. B63b *21/26, 21/52*
U.S. Cl. 9—8 5 Claims



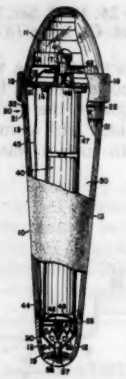
A positively buoyant long spar buoy having a length of at least about 100 feet and a maximum body diameter of about 36 inches, the body being fabricated of lengths of pipe rigidly connected in end-to-end relation, the body including anti-flooding means adjacent each interpipe connection and being ballasted to float upright with a selected minor portion of its length out of water.

3,559,224
AUTOMATIC LIGHTING DEVICE FOR SALVAGE

Kunio Shimizu, 1–33–2 Asagaya-Minami, Suginami-ku, Tokyo, Japan

Filed Aug. 25, 1969, Ser. No. 852,762
Claims priority, application Japan, Sept. 3, 1968, 43/62,741
Int. Cl. B36b *45/00*
U.S. Cl. 9—8.3 5 Claims

A lighting device comprises a casing having openings at the lower end portion thereof, through the openings of which water enters into the casing as the lighting device floats on the water while revealing the top portion thereof above the surface of water, a diaphragm watertightly fixed within the casing so as to be pushed up by the water entered therein, and an electric circuit including a contact assembly for lighting the lighting device to

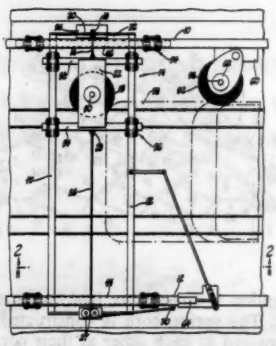


be switched on by means of the diaphragm pushed up. Around the upper portion of the casing and above the surface of the water, there is provided a material permeable by gas but impervious to water to separate a sealed inner chamber from the outer air, and thereby balancing the inner air pressure with the outer air pressure through the material.

3,559,225
VEHICLE CLEANING APPARATUS

Harry K. Gougoulas, 1875 Philomine, Lincoln Park, Mich. 48146

Continuation-in-part of application Ser. No. 754,526, July 30, 1968. This application Apr. 14, 1969, Ser. No. 825,092
Int. Cl. B60s *3/06*
U.S. Cl. 15—21 27 Claims



Vehicle cleaning apparatus comprising a washing area through which a vehicle progresses and at least one brush having a vertical axis of rotation and being suspended from trolleys so as to be movable transversely

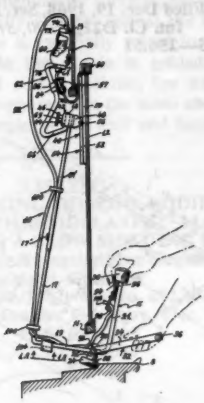
and longitudinally of the vehicle to be cleaned. In one embodiment, a single brush is moved in a substantially triangular path around a moving vehicle so that at least three complete sides of the vehicle are cleaned automatically. In another embodiment, two brushes are moved through reversely symmetrical triangular paths so that each brush cleans each of two sides of the vehicle partially and one side of the vehicle completely. In both embodiments, the brush or brushes and the trolleys to which the brush or brushes are mounted are connected by cables to counterweights to control brush movement relative to the vehicle in accordance with the individual dimensions of the vehicle.

3,559,226
TOOTH BRUSH FOR INTERPROXIMAL AREAS
Robert L. Burns, Lexington, Ky., assignor to The University of Alabama Medical Center Foundation, a corporation of Alabama
Filed May 31, 1968, Ser. No. 734,191
Int. Cl. A46b *3/10, 9/04*
U.S. Cl. 15—167 **1 Claim**

A tooth brush for interproximal areas having elongated wire members twisted on each other with radially extending bristles fixedly secured in place therebetween. A laterally opening passageway is provided in an elongated handle for receiving ends of the twisted wire members which are secured in place by an adjustable retaining member, the handle being bent to position the wire members at an obtuse angle relative to the remainder of the handle.

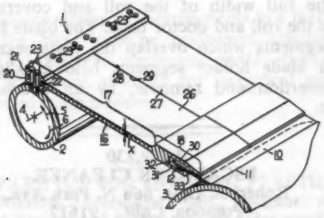
3,559,227
WINDOW CLEANING DEVICE
George R. Schleicher, 1749 Grand Concourse, Bronx, N.Y. 10453
Filed Apr. 14, 1969, Ser. No. 815,643
Int. Cl. A47l *1/08*
U.S. Cl. 15—250.04 **11 Claims**

A window cleaning device whereby the outer side of a window may be readily and easily washed without the necessity of the operator or washer passing through the window to the outer side thereof, the construction being such as to permit the washing of the outer side of a window by an operator positioned at the inner side of the window with ease. The device consists of a squeegee mounted and carried on a frame and wheel operable over the window sill and provided with two handles, one for each hand of the operator, the squeegee being on the outside of the window when in operative position the handles being inside the window actuating the device. A small container of detergent and water is connected to the squeegee and a highly controlled slow drip of water is delivered to the squeegee wiper blade end just sufficiently



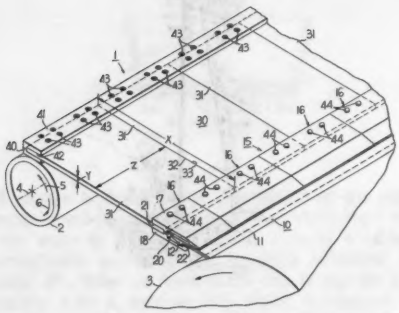
to lubricate and clean the blade and to wash the window surface.

3,559,228
DOCTOR BLADE HOLDING ASSEMBLY
Donald B. De Noyer, Beloit, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Dec. 19, 1968, Ser. No. 785,198
Int. Cl. D21g *3/00, 3/02, 3/04*
U.S. Cl. 15—256.51 **1 Claim**



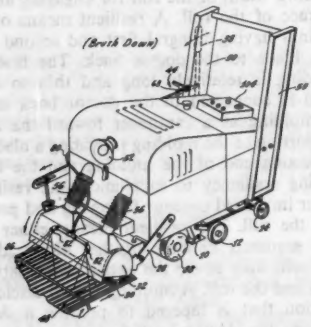
A doctor blade holding assembly is disclosed having a pivotable doctor back parallel to and spaced from a roll of a paper making machine. A resilient blade extends along the entire width of the roll for engaging and scraping the surface of the roll. A resilient means of one or more moldings having integral first and second portions connect the blade to the doctor back. The first portion of the molding is relatively long and thin so as to be resilient and is connected to the doctor back to project the entire molding as a cantilever toward the roll with the second portion of the molding providing a blade holder on the projecting end of the molding and the first portion providing resiliency to supplement the resiliency of the blade for improved contour following and pressurized scraping of the roll. The resilient means, either a single molding or segments bonded together along edges normal to the roll, may cover the entire space between the doctor back and the roll. A molding is also disclosed with a first portion that is tapered to provide a decreasing thickness from the doctor back end thereof toward the blade holding portion to provide desired flexibility and deflection characteristics with the greater thickness of the molding being in the area where the bending movement is concentrated, that results from bending the molding in a direction transverse to the blade.

3,559,229
DOCTOR ASSEMBLY
Donald B. De Noyer, Beloit, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Dec. 19, 1968, Ser. No. 785,199
Int. Cl. D21g *3/00, 3/02, 3/04*
U.S. Cl. 15—256.51 **1 Claim**



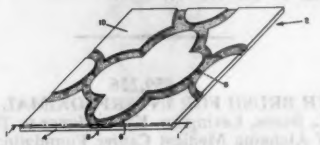
A doctor is disclosed having a pivotable doctor back parallel to and spaced from a roll of a paper making machine. A blade carried by a blade holder is resiliently connected to the doctor back by a thin plate of substantial width and sufficient length relative to its thickness so as to be resilient and supplement the resiliency of the blade for improved contour following and pressurized scraping of the roll. The thin plate, made up of several segments abutting each other along edges normal to the roll, extends the full width of the roll and covers the space between the roll and doctor back. The blade holder comprises segments which overlap the plate segments, with adjacent blade holder segments held in alignment for blade insertion and removal, by an overlapped plate segment.

3,559,230
ESCALATOR CLEANER
Robert R. Ogle, 666 N. Park Ave., Pomona, Calif. 91617
Continuation-in-part of application Ser. No. 667,574, Sept. 13, 1967. This application Mar. 24, 1969, Ser. No. 814,504
Int. Cl. A47l *7/02*
U.S. Cl. 15—302 **5 Claims**



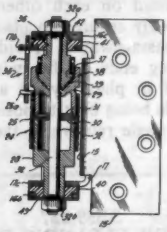
An improved vacuum cleaning machine is described herein which may be wheeled to a position over the moving platform of an escalator; and which functions in an improved manner to clean the escalator as it moves under a rotating cleaning brush of the machine.

3,559,231
VINYL FLOOR RUNNER
John P. Hill, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed Oct. 25, 1968, Ser. No. 770,642
Int. Cl. A47g *27/04*
U.S. Cl. 16—4 **1 Claim**



A vinyl floor runner made from a transparent sheet with a decorative pattern on one side and floor gripping projections on the opposite side. The placement of the floor gripping projections is coordinated with the design on the other side to mask the projections. Masking of the projections tends to permit the transparent vinyl runner to blend in with the floor that it overlies to create a more pleasing overall aesthetic effect.

3,559,232
ELECTRICALLY ACTUATED DOOR HOLDER WITH MANUAL OPENING AND CLOSING OVERRIDE, AND AUTOMATIC RELEASE TO EFFECT CLOSURE
Burke J. Crane, Lombard, Ill., assignor to Rixson, Inc., Franklin Park, Ill.
Filed Mar. 21, 1969, Ser. No. 809,297
Int. Cl. E05f *3/22*
U.S. Cl. 16—50 **10 Claims**



An electrically actuated door holder applied to a hinged door having a closer. The door holder may be manually overridden and also automatically released.

Functionally, the door is held open at any desired angular position when a solenoid is energized to cause a helical spring torque clutch to lock in engagement two relatively rotatable clutch shafts enveloped by the spring. Each clutch shaft is mechanically coupled to a different hinge leaf. In the door opening direction, the spring is unwound relative the clutch shafts to permit manual enlargement of the door opening.

A second cone or torque limiting clutch is mechanically connected in series with the helical spring clutch to enable manual closing of the door when sufficient door closing torque is applied to disengage the cone clutch,

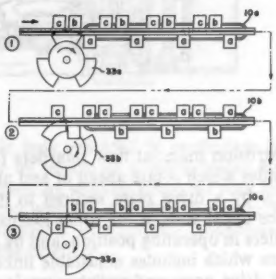
even though this closing torque is insufficient to disengage the helical spring clutch in the door closing direction.

Deenergization of the solenoid by the manual operation of a switch, or by an automatic fire detector, for example, disengages the helical clutch and permits the closer to close the door automatically.

3,559,233
METHOD AND APPARATUS FOR EVISCERATING POULTRY

Gary J. Bottomley, P.O. Box 88, Wilkesboro, N.C. 28697; William M. Nichols, Rte. 4, Box 654, North Wilkesboro, N.C. 28659; Clyde E. Watkins, Box 125, Millers Creek, N.C. 28651; and Larry D. Wilson, Kenleigh Circle, Ken Acres, Wilkesboro, N.C. 28697

Filed Apr. 24, 1969, Ser. No. 818,946
Int. Cl. A22c *21/00*
U.S. Cl. 17—45 **5 Claims**

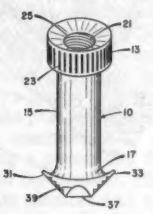


A system for diverting, sequentially, predetermined series of birds from a predetermined path of travel to prescribed paths of travel to present each predetermined series of birds to respective inspection stations longitudinally spaced from each along an eviscerating line. Upper and lower spaced guides cooperate with a drive wheel to convey shackles, of a chicken eviscerating line, to one of two sides of the guides to increase the spacing between shackles presented to an inspection station.

3,559,234
CORNER TOOL AND APPLICATOR NOZZLE

Clark E. Swayze, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 8, 1969, Ser. No. 789,814
Int. Cl. E04f *21/28*
U.S. Cl. 18—3.5 **10 Claims**

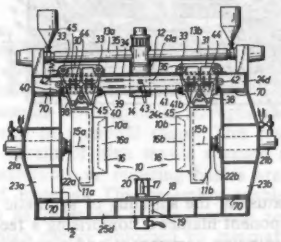


A combination corner finishing tool and fluid applicator nozzle adapted to be removably mounted on the discharge nozzle of a dispensing tube is disclosed. The applicator nozzle has two legs which are perpendicular to each other and have cross ribs or fins on their outer surfaces which serve to scrape clean a surface which the legs are moved along. When one leg of the nozzle is held against one of two perpendicular surfaces, the other leg of the nozzle automatically is flush against the second surface. Thus, the nozzle is especially suited for dispensing caulking materials. As the nozzle is guided along the seam between a wall and a bathtub, for example, the caulking material is dispensed into the seam and smoothed to a predetermined angle to the wall and bathtub.

3,559,235
DEVICE FOR MAKING HOLLOW BODIES FROM PREFORMED THERMOPLASTIC MATERIAL ACCORDING TO A BLOW MOLDING PROCESS

Reinold Hagen, Hangelar uber Siegburg, Rhineland, Germany

Filed Dec. 20, 1967, Ser. No. 692,194
Claims priority, application Germany, Dec. 23, 1966, K 60,999
Int. Cl. B29f *3/014*
U.S. Cl. 18—5 **8 Claims**

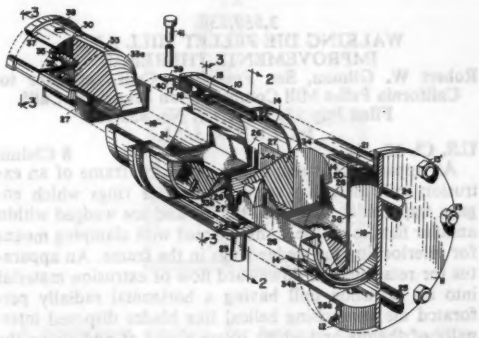


The disclosure relates to improvements in a method and apparatus for blow molding preformed articles which are positioned between reciprocal mold elements, the carriers of which are arranged for reciprocal movement between spaced beam members.

3,559,236
APPARATUS FOR MOLDING PLASTIC

James A. Merritt, Livermore, Calif., assignors to Glass Reinforced Engineered Materials, Inc., Haywood, Calif.

Continuation of application Ser. No. 665,055, Sept. 1, 1967. This application Dec. 2, 1969, Ser. No. 876,178
Int. Cl. B30b *5/02, 11/32*
U.S. Cl. 18—5 **10 Claims**



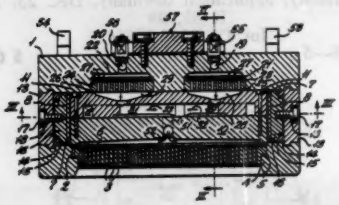
Plastic molding apparatus of an autoclave type having a hot gas or steam deformable inner liner which conforms to a light-weight, two-part mold containing curable

plastic. The introduction of steam conforms the liner to the exterior of the mold and provides heat and pressure to cure the plastic.

3,559,237
APPARATUS FOR PRODUCING SYNTHETIC YARNS FORMED OF BICOMPONENT FILAMENTS

Paul V. M. van den Biggelaar, Dieren, Gelderland, and Jan C. Rijkaart, Arnhem, Netherlands, assignors to American Enka Corporation, Enka, N.C.

Filed Nov. 22, 1967, Ser. No. 685,049
Claims priority, application Netherlands, Nov. 23, 1966, 6616462
Int. Cl. D01d
U.S. Cl. 18—8 23 Claims



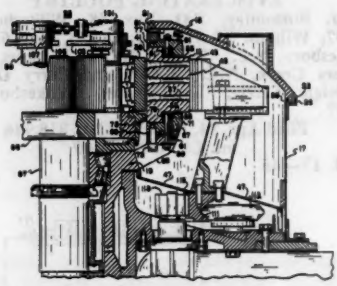
An apparatus for the spinning of synthetic yarns made up of bicomponent filaments comprising a feed means for each liquid spinning component and a spinning assembly housing connected to the feed means. The assembly housing includes a substantially horizontal spinneret plate with spinning orifices arranged in a pattern, a closable access means and guide means for directing the spinning components from the feed means to the orifices in the spinneret plate. The guide means is insertable and removable through the closable access means. The assembly housing has a horizontal section which is oblong and has a length which is approximately about one and one half to about two times its width and the spinneret plate which is placed within the assembly housing has, in the horizontal plane, an oblong configuration and also dimensions which are about the same order of magnitude as those of the assembly housing. The assembly, in this manner, provides a rigid compact construction that promotes rapid and uniform heat transfer to the spinning components within the housing upon being placed in a heated jacket or the like.

3,559,238
WALKING DIE PELLET MILL AND IMPROVEMENTS THEREFOR

Robert W. Gilman, San Francisco, Calif., assignor to California Pellet Mill Company, San Francisco, Calif.

Filed July 11, 1967, Ser. No. 652,539
Int. Cl. B29f *3/01*
U.S. Cl. 18—12 8 Claims

An apparatus for securing a die to the frame of an extrusion mill including segmental wedge rings which engage trapezoidal flanges on the die and are wedged within annular flanges on the frame thereof with clamping means for interlocking the wedge rings in the frame. An apparatus for retarding the downward flow of extrusion material into an extrusion mill having a horizontal radially perforated die comprising helical like blades disposed internally of the die and which rotate ahead of and above the extrusion rollers. An apparatus for retaining extrusion rollers in operating position internally of the die of an extrusion mill comprising a cover plate which is secured to drive posts and supports the upper ends of the roller journal shafts. An apparatus for adjusting rollers of an extrusion mill comprising an adjustable link extending between a drive post in the roller assembly and a radial extension arm secured to the roller journal shaft which has a journal center eccentric of its roll center. An extrusion assembly for a walking die pellet mill characterized by a segmental wedge ring which engages a trapezoidal flange on the extrusion die to secure the die to the frame of the

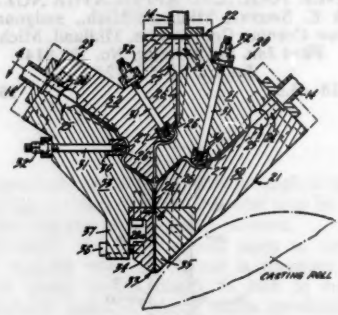


mill, by extrusion material flow retarders formed of helical like blades which rotate ahead of and above the extrusion rollers, by a drive plate secured to drive posts and supports the upper ends of the roller journal shafts retaining the rollers in operating position, and by a roller adjustment means which includes adjustable links extending between said drive posts and radial extension arms secured to the roller journal shafts which have their journal centers eccentric of their roll centers.

3,559,239
MULTILAYER EXTRUSION DIE

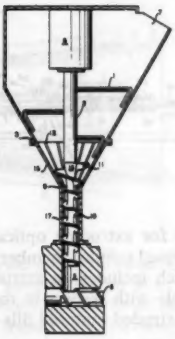
William A. Work, Neenah, Wis., and George A. Huppenthal, Butler, N.J., assignors to American Can Company, New York, N.Y.

Filed Feb. 27, 1968, Ser. No. 708,677
Int. Cl. B29f *3/00*
U.S. Cl. 18—12 7 Claims



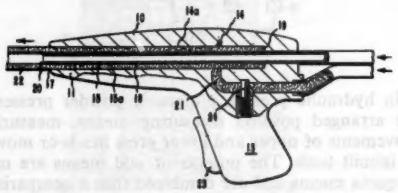
An improved extrusion die for the simultaneous extrusion of multilayer flat films or sheets of thermoplastic materials wherein improved flow passages between a plurality of manifolds supplying material from separate sources of resins and a common flow passage are provided.

3,559,240
BULK PLASTIC HANDLING
Edward J. Kosinsky and William E. Saunders, Bartlesville, Okla., assignors to Phillips Petroleum Company, a corporation of Delaware
Filed July 19, 1967, Ser. No. 654,458
Int. Cl. B29f 3/01
U.S. Cl. 18—12 4 Claims



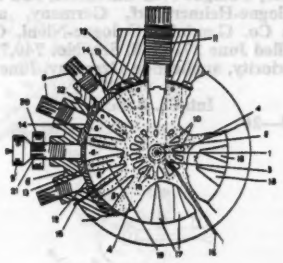
Compressible bulk material in particulate form is fed to an extruder by means of a force feeder having compression and metering sections provided with grooves substantially aligned with the direction of plastic flow wherein the bulk plastic is substantially compressed prior to injection into the extruder.

3,559,241
APPARATUS FOR PRODUCING A HOLLOW STRIP OF POLYMERIC MATERIAL
Edward Chu, Philadelphia, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed May 31, 1968, Ser. No. 733,583
Int. Cl. B29d 23/04
U.S. Cl. 18—14 2 Claims



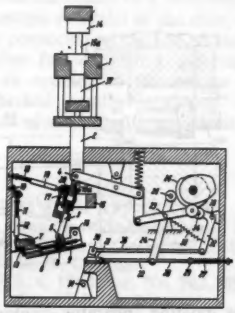
The disclosure describes an apparatus which is adapted for use in producing a hollow strip or tube of polymeric material of any desired length from a fluid polymeric composition; the apparatus preferably is a gun-like device which can be held by a person and operated with one hand during extrusion of the product from the front (discharge) end; the apparatus comprises (A) a chamber (e.g. a cylinder) for holding a pressurized fluid, for example a thixotropic polymeric composition, (B) a mandrel (e.g. a tube) mounted within chamber (A) to form an extrusion chamber between the sidewall of chamber (A) and the outer wall of mandrel (B), the front end of mandrel (B) extending a short distance beyond the front end of chamber (A), and (C) a duct means for introducing a fluid polymeric composition into the rear portion of said extrusion chamber.

3,559,242
HIGH PRESSURE CELLS
Jacob Marcovitch, Johannesburg, Transvaal, Republic of South Africa, assignor to Rotary Profile Anstalt, Vaduz, Liechtenstein
Filed Mar. 12, 1968, Ser. No. 712,498
Int. Cl. B29c 3/00
U.S. Cl. 18—16 27 Claims



The invention is concerned with the method and apparatus for generating or dissipating very high pressures by means of enclosing a reaction zone in a continuous mass of material of low tensile strength and having no sudden change in sectional shape. This material is enclosed in a sheath of high tensile strength material and pressure magnifying or reducing bodies are included in the mass of material. This assembly enables very high pressures to be generated in the reaction zone and controlled through energy absorbed by interparticulate friction in the mass of the low tensile strength material.

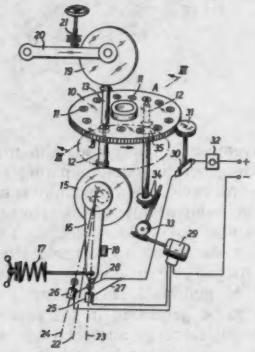
3,559,243
APPARATUS FOR CONTROLLING THE MOVEMENT OF THE MATRIX OF METAL-POWDER PRESSES
Rolf Hermes, Rheydt-Giesenkirchen, Germany, assignor to Mannesmann-Meer Aktiengesellschaft, Monchengladbach, Germany
Filed May 28, 1968, Ser. No. 732,606
Claims priority, application Germany, July 5, 1967, M 74,631
Int. Cl. B30b 11/02, 15/14
U.S. Cl. 18—16.5 3 Claims



A mechanism controls, for instance steplessly adjustably, the movement of the matrix of a press during the compression stroke, in dependence on the movement of the upper punch. An element is connected to the upper

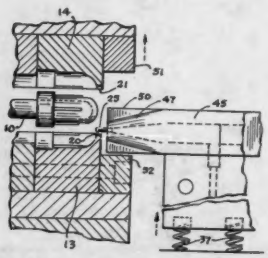
punch which moves synchronously therewith and engages a mechanism that is connected to the matrix for effecting movement of the latter after a predetermined movement of the upper punch.

3,559,244
PRESS FOR MAKING OBJECTS OF EQUAL WEIGHT
Fritz Grether, Cologne-Neu Ehrenfeld, and Helmut Janson, Cologne-Heimersdorf, Germany, assignors to Kilian & Co. G.m.b.H., Cologne-Niehl, Germany
Filed June 27, 1968, Ser. No. 740,723
Claims priority, application Germany, June 29, 1967, K 62,677
Int. Cl. B29c *3/06*
U.S. Cl. 18—20 **9 Claims**



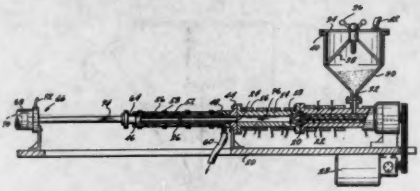
The volume of the mold chambers of a tabletting press is adjusted in accordance with the measured compressing pressure so that the same amount of a powdery substance is filled into the mold chambers irrespective of its consistency whereby tablets of equal weight are pressed.

3,559,245
MOLDING APPARATUS
George R. Ryan, 1431 Henry Place, Waukegan, Ill. 60085
Filed Apr. 2, 1968, Ser. No. 718,160
Int. Cl. B29f *1/03*
U.S. Cl. 18—30 **10 Claims**



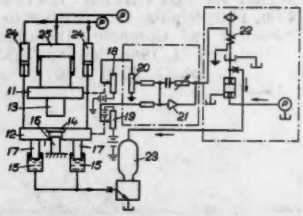
Runnerless molding apparatus employing cooled mold sections and a heated manifold assembly in which the only contact between the heated manifold assembly and the cooled mold sections is by injection nozzles extending outwardly from the manifold assembly and movable transversely into an out of contact with the mold sections between each molding cycle.

3,559,246
APPARATUS FOR MAKING OPTICAL FIBERS
Paul Fyfe, Downey, Calif., assignor to Poly-Optics, Inc.
Original application May 20, 1965, Ser. No. 457,407, now Patent No. 3,472,921. Divided and this application May 31, 1968, Ser. No. 740,812
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 **10 Claims**



An apparatus for extruding optical fiber plastic material into a preformed tubular member of optical fiber plastic material which includes an extrusion nozzle which is relatively movable with respect to the preformed tubular member as the extruded material fills the tubular member.

3,559,247
MEANS FOR HYDRAULIC PRESSES
Paul Larsson, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Mar. 18, 1968, Ser. No. 713,910
Claims priority, application Sweden, Mar. 22, 1967, 3,999/67
Int. Cl. B29c *3/00*
U.S. Cl. 18—32 **7 Claims**

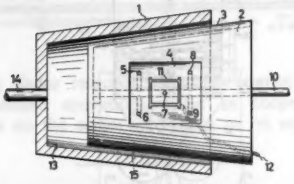


In hydraulic presses, preferably powder presses, there are arranged position measuring means, measuring the movements of upper and lower press heads or movements of inbuilt tools. The outputs of said means are modified in quota means and are combined into a comparison signal for controlling a hydraulic valve to control the movements of the heads.

3,559,248
DEVICE FOR APPLYING PRINTED FOILS TO MOLDED ARTICLES
Günther Stockmann, Uchte, Germany, assignor to Dr. Ing, Fritz Sommer NACHF, Ludenscheid, Germany
Filed Mar. 22, 1968, Ser. No. 715,408
Claims priority, application Germany, Mar. 25, 1967, St 26,668
Int. Cl. B29c *24/00;* **B29d** *3/00*
U.S. Cl. 18—36 **3 Claims**

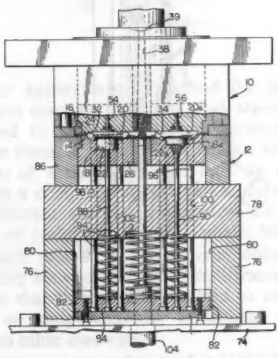
An apparatus for transferring a printed foil from the surface of a first member within close tolerance to a predetermined portion of the surface of a second member. The members constitute a matrix and a patrix, the second member preferably being the matrix, and the second mem-

ber is part of a mold such as an injection mold. The first member has a depression in the surface thereof having an outline corresponding to the outline of the foil and suction means communicating with the depression for holding the foil within the depression. An electrostatic charging means is par.ly located within the depression for charging the foil held within the depression. Means are



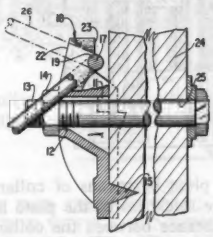
provided for moving the members relative to each other so as to juxtapose the positioned foil with the area on the second member to which the foil is to be transferred and pneumatic pressure means are provided in communication with the depression for blowing the foil toward the second member.

3,559,249
PLASTIC-MOLDING APPARATUS
Roy A. Patton, Jr., Grabill, Ind., assignor to Hood, Gust, Irish & Lundy, Fort Wayne, Ind.
Filed June 8, 1967, Ser. No. 644,573
Int. Cl. B29f *1/00*
U.S. Cl. 18—42 **6 Claims**



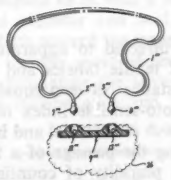
The molding apparatus of this invention includes a die having a mold cavity, the die including two mold sections selectively movable into and out of closing engagement, these mold sections having parting surfaces which are sealingly engageable with each other, the mold cavity being defined by two mating cavity portions in the parting surfaces, respectively, the cavity having opposite ends, one end being in one cavity portion and the other end being in the other cavity portion, a circular gate provided in the parting surfaces, which encircles the cavity, and an annular sprue also provided in the parting surfaces, which encircles the cavity, the sprue being radially positioned between the gate in the cavity and located approximately midway between the opposite ends of the cavity.

3,559,250
GUY HOOK FOR MOUNTING ON UTILITY LINE POLES
Owen R. Huggins, 136 West Ave., Darien, Conn. 06820
Continuation-in-part of application Ser. No. 655,160, July 21, 1967. This application June 23, 1969, Ser. No. 835,590
Int. Cl. B63b *21/04*; **F16g** *11/06*
U.S. Cl. 24—115 **10 Claims**



A guy and strand hook for mounting on utility line poles wherein the width of the upwardly loop-retaining portion is the same as the widths of the upper hub portion and intermediate portion and where the rear corners of the top of the loop-retaining portion project over the forwardly diverging ends of the groove for the loop to restrain upward movement of a loop seated therein while permitting vertical movement of the loop from substantially vertical downwardly to well above the horizontal.

3,559,251
SHOESTRING ACCESSORY
Jean D. Wilson, 1610 Fernside Blvd., Alameda, Calif. 94501
Filed Aug. 22, 1969, Ser. No. 852,264
Int. Cl. A43c *9/02*
U.S. Cl. 24—143 **5 Claims**

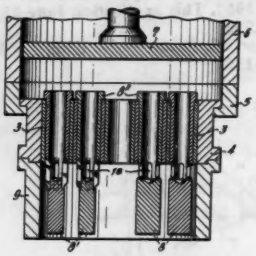


The accessory consists briefly of a shoestring having an end protruding through an eyelet of the shoe, a resiliently spherical member connected to the end of the shoestring, and a base member formed with a generally spherical chamber having an opening to the surface thereof for receipt of the spherical member in a "pop" fit. The accessory in the form of a decorative novelty is attached to the base.

3,559,252
EXTRUSION APPARATUS
Jurgen Schmidt, Monchen-Gladbach, and Hans-Georg Nitzsche, Oeslau, Germany, assignors to Schneider & Co., Frechen/Cologne, Germany
Filed Feb. 6, 1968, Ser. No. 703,355
Int. Cl. B28b *3/26*
U.S. Cl. 25—17 **5 Claims**

Improved apparatus for the extrusion of articles having elongated cavities in them, including an array of parallel tubes removably mounted in a holding plate and having blocked downstream ends and lateral openings extending in the direction of extrusion. During extrusion, the clay or other material first passes through upstream parts of

the tubes then, after having passed beyond the holding plate, passes through the lateral openings in the tubes, and then between the blocked downstream ends of the tubes. In accordance with the invention the tubes are re-



tained in the holding plate by means of collars at their upstream ends, and the thickness of the plate is approximately equal to the distance between the collars and the lateral openings in the tubes.

3,559,253

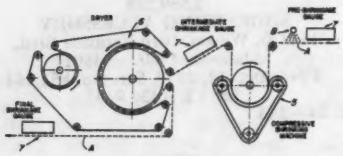
TEXTILE WEB SHRINKING APPARATUS COMPRISING MEANS FOR MEASURING DISTANCE BETWEEN INDEX MARKS ON THE WEB

Nestor W. Pandell, Waccabuc, and Robert M. Dowling, New Rochelle, N.Y., assignors to Cluett, Peabody & Co., Inc., Troy, N.Y.

Filed Nov. 5, 1968, Ser. No. 773,576

Int. Cl. D06c *21/00*; G01t *1/16*; H01j *39/12*

U.S. Cl. 26—18.6 **8 Claims**



This invention is directed to apparatus for the compressive shrinking of textile fabrics and having a gauge for measuring the distance between equally spaced longitudinally aligned photo-sensible index marks on a continuously advancing web of material and includes a trigger photocell for detecting the passage of a first index mark and for activating a plurality of counting photocells to measure the continuing passage of the first index mark until a second index mark reaches the trigger photocell and causes it to cause discontinuance of the passage measurement of the first index mark. Visual means are provided to indicate the length of passage of the first index mark along the counting photocells until passage measurement is discontinued.

3,559,254

APPARATUS FOR STUFFER CRIMPING TEXTILE STRANDS

Robert K. Stanley, Media, Pa., assignor to Techniservice Corporation, Kennett Square, Pa.

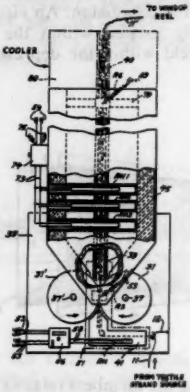
Continuation of application Ser. No. 650,762, July 3, 1967, which is a continuation-in-part of application Ser. No. 349,338, Mar. 4, 1964, now Patent No. 3,348,283, dated Oct. 24, 1967. This application June 9, 1969, Ser. No. 835,883

The portion of the term of the patent subsequent to Oct. 24, 1984, has been disclaimed

Int. Cl. D02g *1/12*

U.S. Cl. 28—1.6 **4 Claims**

A stuffer-crimper for textile strands is provided with means for preheating such a strand to crimping temperature, means for maintaining the strand at substantially such crimping temperature while it is being crimped



and subsequently being stress-relieved therein, and means for cooling the crimped, stress-relieved strand.

3,559,255

THREADING DEVICE FOR YARN HEATERS

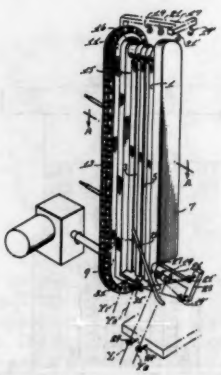
Christopher Hugh John Cockroft, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 12, 1968, Ser. No. 744,464

Claims priority, application Great Britain, July 19, 1967, 33,229/67

Int. Cl. D02j *13/00*

U.S. Cl. 28—62 **3 Claims**



A two-sided contact heater for one or more threadlines is threaded up by means of a guide device travelling orbitally around the heater on an endless chain.

3,559,256

MACHINE CONTROL APPARATUS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

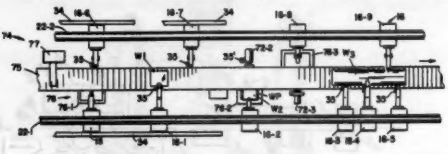
Continuation-in-part of applications Ser. No. 387,954, Aug. 6, 1964, now Patent No. 3,372,568, and having as a parent application Ser. No. 557,415, Apr. 10, 1956, now Patent No. 3,049,247. This application Mar. 12, 1968, Ser. No. 712,443

Int. Cl. B23q *91/00, 91/02*

U.S. Cl. 29—33 **5 Claims**

A machine tool apparatus is provided employing a plurality of machines which are simultaneously auto-

matically controlled to perform preprogrammed operations on either the same or different work pieces. In one form, two machine tools or tool heads are supported on the same guide way or track and may separately move



therealong under remote, automatic control to perform preprogrammed operations either in cooperation with each other on the same work piece or on separate work pieces.

3,559,257

MACHINE CONTROL APPARATUS

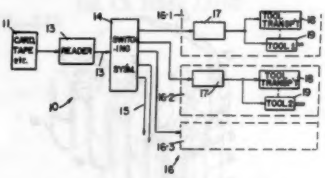
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of application Ser. No. 387,954, Aug. 6, 1964, now Patent No. 3,372,568, which is a continuation-in-part of application Ser. No. 219,357, Aug. 13, 1962, which in turn is a continuation-in-part of application Ser. No. 557,415, Apr. 10, 1956, now Patent No. 3,049,247. This application Mar. 12, 1968, Ser. No. 717,065

The portion of the term of the patent subsequent to Mar. 12, 1985, has been disclaimed

Int. Cl. B23q *91/00*

U.S. Cl. 29—33 **8 Claims**



A control apparatus and method for machines such as production machine tools and work transfer machines, are provided to permit automatic machine tool operation. In one form, a plurality of machine tools or operating portions of a single machine tool are remotely controlled from a computer to simultaneously operate on the same or different articles of work by the simultaneous generation of command control signals. Means are provided at each tool or operating component thereof for discriminating between different simultaneously generated messages so that the message destined to control the machine tool or component may be utilized without interference from other messages.

3,559,258

METHOD AND APPARATUS FOR BURNISHING A BORE

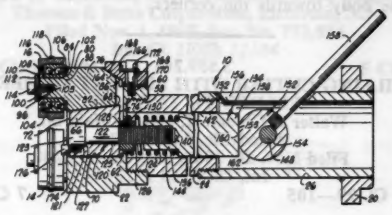
William A. Gardner, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 29, 1969, Ser. No. 795,009

Int. Cl. B24b *39/02*

U.S. Cl. 29—90 **11 Claims**

A tool for burnishing and work hardening a bore comprising an elongated flexible body having narrow rotatable rollers positioned around the periphery thereof. One of said rotatable rollers is adjustable in directions perpendicular to the axis of said body so that it may be locked in a position against the bore causing the body to deflect and the other rollers to contact the bore. The bore to be burnished is rotated while the tool is moved progressively along the bore. When the tool has passed through the bore thereby burnishing the bore, the adjustable roller is retracted allowing the tool to be removed without scratching the burnished surface of the bore.



3,559,259

METHOD FOR CONNECTING A LONGITUDINAL VIBRATOR WITH A BENDING VIBRATOR IN AN ULTRASONIC VIBRATING CUTTING SYSTEM, A TOOL AND A TOOL HOLDER THEREOF

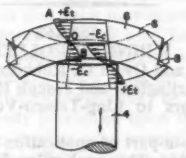
Junichiro Kumabe and Osamu Taniguchi, Tokyo, Japan, assignors to Rikagaku Kenkyusho, Kitaadachi-gun, Saitama-ken, Japan

Filed Dec. 26, 1968, Ser. No. 787,060

Claims priority, application Japan, Dec. 30, 1967, 43/85,205, 43/85,206, 43/85,211

Int. Cl. B26d *1/00*; B23b *3/00*

U.S. Cl. 29—96 **6 Claims**



A tapered hole in the thickwise direction of a bending vibrator being adapted to fit with a mating tapered shape of a longitudinal vibrator and said tapered hole being provided with reliefs toward the upper and under sides of bending vibrator thereby avoiding heat development from the connection, eliminating the adverse effect of thermal expansion of the cutting edge and reducing the cutting cost accordingly.

3,559,260

DETACHABLE CUTTING INSERTS

Lionel Fine, Coventry, England, assignor to Wickman Wimet Limited, Coventry, England

Filed Mar. 10, 1969, Ser. No. 805,659

Claims priority, application Great Britain, Mar. 13, 1968, 12,141/68

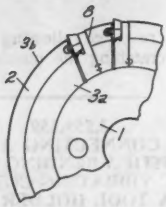
Int. Cl. B26d *1/00*

U.S. Cl. 29—96 **3 Claims**

A machine tool cutting insert comprising a polygonal body having on at least one face a continuous land extending around its marginal edges, and a co-planar central plateau having sides opposite sides of the body characterised in that the sides of the plateau are convex so that

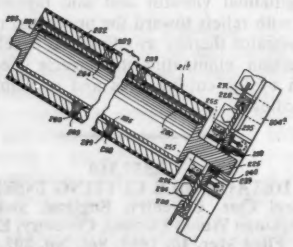
the intervening groove formed between the plateau and the land widens from points midway between the corners of the body towards the corners.

3,559,261
MILLING CUTTER WITH BIT SEAT MEMBERS WELDED TO THE BODY
Walter J. Greenleaf, 608 N. Main St., Meadville, Pa. 16335
Filed Nov. 20, 1968, Ser. No. 777,240
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 **7 Claims**



Patent 3,104,453 is improved by arc welding the bit seat members to the body at at least two points on the junctions between each bit seat member and the body and the trailing sides of the slots receiving the bit seat member, the points being remote from the bit seats.

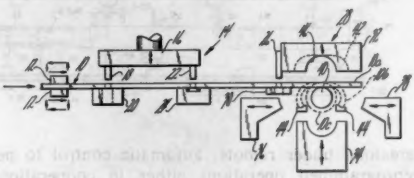
3,559,262
WRINGER ROLLERS
John D. Glenn and Owen G. Robbins, Dallas, Warren C. Schwemer, Arlington, and Joseph R. Silverman, Dallas, Tex., assignors to Ling-Temco-Vought, Inc., Dallas, Tex.
Continuation-in-part of application Ser. No. 368,038, May 18, 1964. This application June 28, 1967, Ser. No. 649,712
Int. Cl. D06f *61/02, 67/02*
U.S. Cl. 29—130 **4 Claims**



A wringer assembly having a pair of rollers between which wet material is transportable and compressed to wring excess moisture therefrom. Each wringer roller has means for limiting bowing or deflection thereof intermediate the ends thereof.

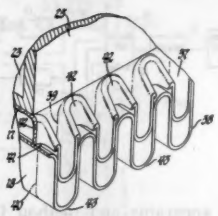
3,559,263
METHOD FOR MAKING FORMED ARTICLES WITH SHAPED END PORTIONS FROM STRIP STOCK
Erman V. Cavagnero and Joseph F. Loftus, Torrington, Conn., assignors to The Torrington Manufacturing Company, Torrington, Conn.
Filed Apr. 24, 1968, Ser. No. 723,764
Int. Cl. B21h *1/12;* **B21d** *53/10;* **B23p** *17/00*
U.S. Cl. 29—148.4 **21 Claims**

Method for making formed articles with shaped end portions from strip stock comprising the steps of advancing a strip, partially severing and at least partially shaping end portions of adjacent workpieces, severing workpieces, forming workpieces to provide articles, and optionally welding together end portions. The partial severing and partial end portion shaping step may be carried out in a



single step or in subsidiary steps involving respectively partial severing and end shaping. The forming step may comprise subsidiary partial and full forming steps with additional end shaping interposed therebetween. A wide variety of end shapes may be provided.

3,559,264
REGENERATOR SPACER MANUFACTURE
Joseph W. Bracken, Jr., Redford Township, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 25, 1968, Ser. No. 778,398
Int. Cl. B21d *53/00;* **B21k** *29/00;* **B23p** *15/26*
U.S. Cl. 29—157.3 **12 Claims**

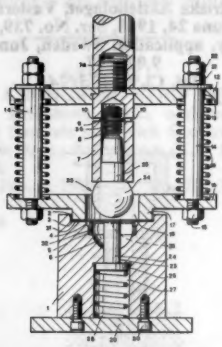


A radial-flow rotary regenerator matrix includes an outer sealing ring or outer rim. A radially yieldable structure disposed between this sealing ring or rim and the heat transfer body of the matrix is made up of two interdigitated corrugated strips which may slide radially one within the other.

3,559,265
APPARATUS FOR FORMING LINING CAPS FOR BALL AND SOCKET JOINTS
Claudio Noris and Carlo Cane, Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy
Filed July 15, 1968, Ser. No. 744,978
Claims priority, application Italy, July 28, 1967, 52,593/67, Patent 808,396
Int. Cl. B23p *11/00, 19/00*
U.S. Cl. 29—200 **6 Claims**

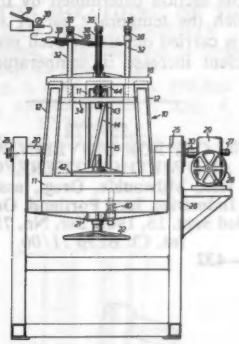
An apparatus for forming lining caps for ball and socket joints has a shaping die has a hemispherical cavity conforming to the curvature of the socket. A first and a second annular seating are formed in the die coaxially with each other and with the hemispherical cavity. A fabric disc is located on the first seating. A resilient ring is located on the second seating and surrounds the hemispherical cavity. A holder for the ball member of the joint presses the ball portion thereof onto the fabric disc and

presses the disc through the resilient ring and into the hemispherical cavity, whereby the disc is shaped into



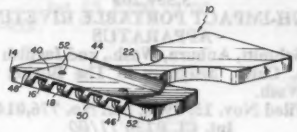
its proper form and is surrounded by the resilient ring. The resilient ring holds the shaped cap on the ball.

3,559,266
ASSEMBLY TOOL FOR LAMINATED STATOR PACKS
Tony Frederick Miles, Stamford, England, assignor to Newage Lyon Limited, Stamford, England
Filed Aug. 5, 1968, Ser. No. 750,248
Claims priority, application Great Britain, Aug. 4, 1967, 36,026/67
Int. Cl. H05k *13/00*
U.S. Cl. 29—203 **4 Claims**



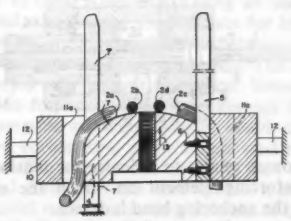
The invention relates to an assembling machine for assembling packs of stamped laminations for welding to constitute the iron stator cores of dynamo-electric machines. The machine comprises a cage into which the laminations can be inserted individually one upon another to form a stack, the cage having a hydraulic press at one end for compressing the stack. The cage is mounted for rotation about the axis of the stack in a cradle which is itself pivoted for rotation about a horizontal axis transverse the pivotal axis of the cage, so that after a stack of laminations has been inserted into the cage with its axis vertical and has been compressed by the hydraulic press, the cage can be swung down to a horizontal orientation with the stack still compressed in it by the press, to facilitate the welding of the edges of the laminations together. Locking means is provided for locking the cage in a number of predetermined angular positions convenient for performing the welding operation.

3,559,267
TOOL
Edward J. Castellani, South Plainfield, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Nov. 1, 1968, Ser. No. 772,584
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 **5 Claims**



The disclosure is directed to a tool for installing and removing bus connectors from a plurality of contact pins of a multi-pin connector board. The tool consists of two end faces each of which has a plurality of apertures therein sufficient in diameter and depth to receive therein the contact pins of said board. A bus connector will be applied to the uppermost portion of the pins then the pin tips will be introduced into the apertures within said tool and the tool by forcing downwardly thereon will cause the bus connector to take a position adjacent the surface of the board itself. The apertures are chamfered at their entry to facilitate the entry of the contact pins within the apertures and also to provide desired relief for deformance of any material of the bus connector about the pin as the pin is inserted. The opposite ends of the tool are of different lengths so that each may accommodate a different number of apertures to be used for short or long bus connectors. In addition, provision is made for the inclusion of an extracting plate adjacent either, or both, of the ends which extraction plate may be used to remove a bus connector already positioned upon the contact pins. The extraction plate consists of a comb-like end having a plurality of slots of sufficient size to go about the contact pins. The extraction plate is movable from a first position out of contact with the pins to a second position in contact with the pins thus trapping the bus connector therebetween and upon the application of force to the tool, in a direction away from the board, the bus connector may be removed therewith.

3,559,268
DRAWING-IN TOOL FOR THE DRAWING OF COILS INTO STATOR GROOVES
Hans Droll, 6 Bergen-Enkheim, Nordring 75, Germany
Filed Oct. 24, 1969, Ser. No. 869,286
Claims priority, application Germany, Apr. 11, 1969, P 19 18 485.1
Int. Cl. H02k *15/00*
U.S. Cl. 29—205 **4 Claims**



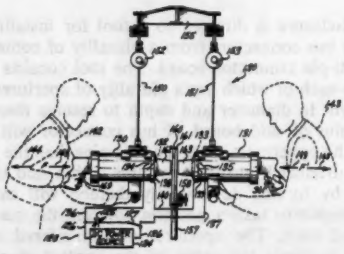
A device for placing pre-wound coils into stator grooves including a generally circular stripper member movable through the stator. Teeth are arranged about the periphery of the stripper member with fingers in slots between the teeth. Some fingers, and preferably at least

one finger adjacent each tooth which contains a prewound coil to be placed into the stator is fixed onto the stripper member for movement therewith as the latter moves through the stator.

3,559,269
HIGH-IMPACT PORTABLE RIVETING APPARATUS

Hubert A. Schmitt, Auburn, Wash., and Jagdish S. Sekhon, Torrance, Calif., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 15, 1968, Ser. No. 776,014
Int. Cl. B23p 11/00
U.S. Cl. 29—243.54 16 Claims

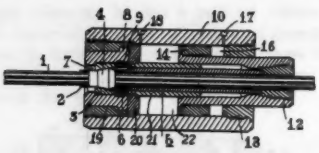


A high-impact tool is disclosed as part of a ram component of an electro-mechanical gun, as shown in FIG. 1, which converts a rapidly changing electric current passing through its coil into a mechanical force acting between a conductor plate on the ram and the coil to propel the ram and its forming surface against a workpiece to form it. A pair of portable electro-mechanical riveting guns, as shown in FIGS. 3–7, is described along with an electrical system, shown in FIG. 8, which interlocks their operation to insure a simultaneous ram impact on each end of the rivet. The power supply, for operator safety, is isolated from ground as it discharges through the coils. A system, shown in FIGS. 5–7, for proper gun alignment is disclosed wherein increased back-pressure of fluid or gas outlets, blocked by proper gun positioning against the workpiece, operates control switches permitting firing of the guns.

3,559,270
DEVICE FOR EXTRUDING AN ANCHORING MEMBER ON A REINFORCING ELEMENT

René Beghi, Bois Colombes, France, assignor to Societe des Grands Travaux de Marseille, Societe Anonyme, Paris, France

Filed Apr. 22, 1968, Ser. No. 723,110
Int. Cl. B21d 39/04
U.S. Cl. 29—282 1 Claim



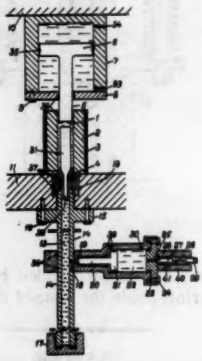
The disclosure relates to a device for tensioning a prestressed reinforcing element on which the steel socket constituting the anchoring head is drawn.

This device consists essentially of a cylinder-and-piston actuator of which the annular cylinder receives on one side a hollow piston adapted to receive the reinforcing element therethrough, said piston being rigid with a thrust tube adapted to force said anchoring socket through a die fitted in the opposite end of the cylinder for drawing said socket on the reinforcing element.

3,559,271
HYDROSTATIC EXTRUSION OF POWDER

Jan Nilsson, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed June 24, 1968, Ser. No. 739,487
Claims priority, application Sweden, June 26, 1967, 9,071/67
Int. Cl. B22f 3/24
U.S. Cl. 29—420.5 13 Claims



Rods or wire are produced from powder by forming a billet compacted to great density and provided on its surface with a temporary, liquid-tight barrier of nonmetallic yielding material.

The billet is enclosed in a pressure chamber located above a die, within which chamber a liquid can be compressed. The cold billet is formed by hydrostatic extrusion to a cross section determined by the nozzle of the die after which the temporary barrier is removed. The deformation is carried out under such pressure as to produce a sufficient increase in temperature to sinter the powder.

3,559,272
DRIVING CAP FOR DRIVEPIN, AND TOOL AND METHOD THEREFOR

Yung Shing Hsu, Milwaukie, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Sept. 16, 1968, Ser. No. 759,855
Int. Cl. B23p 11/00
U.S. Cl. 29—432 6 Claims

A drivepin having a driving cap on one end, and a tool for positioning the drivepin in abutting engagement with a hard work surface. A ramrod in the tool ignites a

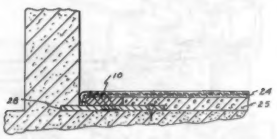
propellant contained in the driving cap to drive the drive-pin into the work surface. A cushioning pad in the driving cap expands to form a gas tight seal within the tool for reducing noise.

3,559,273

CARPET ANCHORING STRIP METHOD

George Porzio, Bricktown, N.J., assignor to George Samaris, Peter Samaris and Nick Samaris, doing business as Samaris Bros., Eatontown, N.J., fractional part interest to each

Filed Jan. 2, 1969, Ser. No. 788,362
Int. Cl. B23p *11/02*
U.S. Cl. 29—446 4 Claims



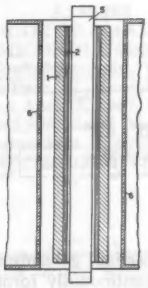
A method for laying wall-to-wall carpet on a concrete floor in which a pad is included under the carpet and in which the anchoring strip is utilized for securing the edges of said carpet adjacent the boundary or wall and in which the wall is routed out at floor level and the anchoring strip is inserted under the wall and secured to the concrete to prevent lifting of the edges of the said carpet.

3,559,274

PROCESS FOR THE SHEATHING OF TUBULAR NUCLEAR FUEL ELEMENTS

Saverio Granata, Milan, Italy, assignor to Snam Progetti S.p.A., Milan, Italy

Filed Aug. 3, 1966, Ser. No. 570,024
Claims priority, application Italy, Aug. 6, 1965, 17,768/65
Int. Cl. B23p *11/02*
U.S. Cl. 29—447 4 Claims



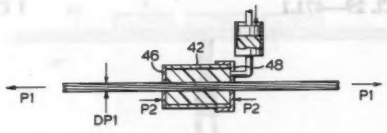
A tubular nuclear fuel element is given an internal sheathing by thrusting a pipe, shrunk by cooling, into the element and then raising the temperature of the pipe to room temperature so that it expands and presses tightly against the inner wall of the fuel element; and thereafter the sheathing is heated internally and the fuel element is cooled externally to cause inter-diffusion at the interface between the sheathing material and the fuel element without establishing preferential crystalline orientations in the fuel.

3,559,275

METHOD OF FORMING AN ANCHORAGE FOR PRESTRESS REINFORCED STRUCTURAL MEMBERS

William M. Slater, 259 Heath St. E., Toronto 7, Ontario, Canada

Filed Oct. 12, 1967, Ser. No. 675,000
Int. Cl. B21d *39/00*
U.S. Cl. 29—452 1 Claim



This invention is concerned with the anchoring of tendons of prestressed structural members. In particular the invention relates to an improved method of forming an anchoring device on a tendon at any point on the length of a tendon. The anchoring device is in the form of a molded protrusion of plastic or other material formed on the tendon, at a temperature sufficiently low to prevent weakening of the tendon, and bonded thereto either by an adhesive or by mechanically deforming the tendon.

The anchoring device may be reinforced internally or externally and may have any one of a number of different external contours as required in use. When the anchoring device has been formed on the tendon the tendon may be stressed to form a prestressed tendon of a structural member and the anchoring devices are adapted to bear against the bearing plates to transfer the tensile load on the tendon to a compressive load on the structural member.

3,559,276

METHOD FOR MAKING A METAL LAMINATE

Ray B. Anderson, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

No Drawing. Filed Dec. 30, 1968, Ser. No. 788,077
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 15 Claims

A method is shown for economically manufacturing an easily formed and easily brazed metal laminate of precisely controlled thickness for use in making corrosion-resistant automotive brake tubing, the laminate incorporating a very thin inner layer of stainless steel of substantially uniform thickness sandwiched between and metallurgically bonded to outer layers of low carbon steel. The method includes the steps of contacting opposite clean surfaces of an annealed stainless steel strip with respective clean surfaces of a pair of annealed low carbon steel strips, squeezing the strips together with substantial reduction in the thicknesses thereof for metallurgically bonding the strips together to form a laminate having an inner layer of stainless steel, and heating the laminate for increasing the strength of the metallurgical bonds between the strip materials and for annealing strip materials. The laminate is then subjected to substantial tension between two spaced locations for minimizing the difference in resistance to compressive reduction which would otherwise exist in the low carbon steel and stainless steel materials in the laminate. The tensioned laminate is then squeezed with substantial force between said spaced locations to achieve substantial reduction in the thickness of the laminate material, thereby to form the desired thin inner layer of stainless steel of substantially uniform thickness without risk of forming discontinuities in the stainless steel layer while simultaneouly reducing the laminate material to substantially the desired overall thickness. The laminate is then annealed again to provide the laminate with the property of easy formability.

3,559,277

WELDING PROCESS FOR HIGH-HARDENABILITY STEEL

Edmondo Marianeschi, Rome, Italy, assignor to Terni Società per l'Industria e l'Elettricita, S.p.A., Rome, Italy

Continuation-in-part of application Ser. No. 338,979, Jan. 20, 1964. This application Nov. 15, 1968, Ser. No. 776,213

Claims priority, application Italy, Feb. 1, 1963, 1,743/63

Int. Cl. B23k *31/02*

U.S. Cl. 29—471.1 1 Claim

A process for treating a high duty not readily weldable steel to provide it with a weldable surface. The surface is first buttered with a weldable coating and then the buttered layer is hot worked while plastic.

3,559,278

METHOD OF MANUFACTURING A HOLLOW ELONGATED THIN-WALLED METALLIC BODY

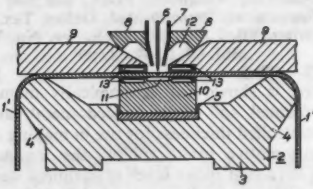
Sven Brandberg, Irsta, and Constan Glandin, Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden, a Swedish corporation

Filed June 3, 1968, Ser. No. 734,061

Claims priority, application Sweden, June 6, 1967, 7,889/67

Int. Cl. B23k *31/02*

U.S. Cl. 29—487 7 Claims



A hollow, elongated, thin-walled body is formed by welding at least one seam to close the body around a mandrel of a material having a greater coefficient of thermal expansion than the material of the body, whereafter the body and mandrel are heated until the thermal stresses in the body are greater than the yield strength of the material of the body. The mandrel has projecting ridges running longitudinally at its corners, and a longitudinal groove in which is mounted a support member which underlies the seam. The body is then passed between rollers to finish the seam.

3,559,279

METHOD FOR BONDING THE FLIP-CHIP TO A CARRIER SUBSTRATE

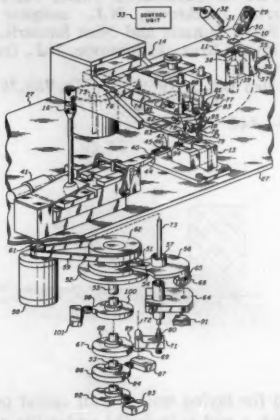
Edwin P. Miklaszewski, Danbury, Conn., assignor to Sperry Rand Corporation

Filed Oct. 14, 1968, Ser. No. 767,431

Int. Cl. B23k *5/22, 31/02*

U.S. Cl. 29—493 1 Claim

A method for face down bonding a flip-chip to a carrier substrate including the steps of orienting the chip by direct reference to its electrical terminals at a given position apart from the substrate; orienting the substrate with reference to the chip at a prescribed position separate from the chip position; transferring the chip from the given position to the substrate position, the transfer being accomplished in a manner to retain the relative orientation of the chip and substrate so that the corresponding electrical terminals thereof are placed in contacting relationship, and applying hot gas solder to the region between the chip and substrate to bond the contacting terminals.



3,559,280

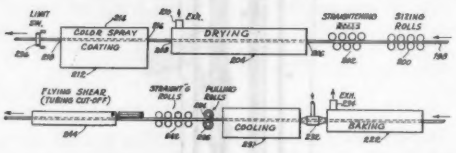
METHOD AND APPARATUS FOR THE CONTINUOUS FORMING, GALVANIZING AND COLORING OF TUBING

Alfred F. Mailhiot, Tinley Park, and Paul J. Hreha, Park Forest, Ill., assignors to Allied Tube & Conduit Corporation

Filed Mar. 13, 1968, Ser. No. 712,716

Int. Cl. B23p *17/00, 25/00*

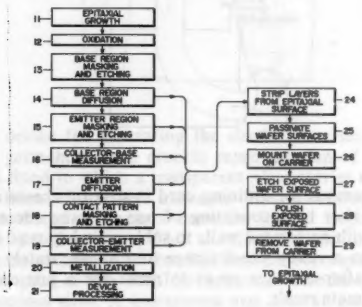
U.S. Cl. 29—527.4 11 Claims



The continuous forming, galvanizing and coloring of tubing wherein the continuously formed and galvanized tubing is overcoated with a color coating as a continuous operation with the tube forming and galvanizing by advancing the tubing after the galvanize coat has been set through processing steps of coating the galvanized surface with a color coating composition formulated of a hardenable resinous vehicle containing a diluent and a tinctorial agent, rapidly heating the coated tubing to drive off the diluent and set the resinous base without bubble formation, cooling the heated tubing to harden the resin, engaging the tubing between driving rolls located upstream of the coating and heating sections to pull the tubing through said processing sections while supporting the tubing to avoid contact with the surface of the tubing from the time

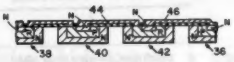
that the coating composition is applied until it is set and then straightening and cutting the colored tubing to lengths, and including means adjacent the path of travel of the tubing in a straight line through the said processing sections for detecting deviations of the tubing from the normal line of travel and means responsive to any such deviations for shutting down the entire line.

3,559,281
METHOD OF RECLAIMING PROCESSED SEMICONDUCTOR WAFERS
Bobby A. Mayberry and Albert E. Ozias, Jr., Tempe, Ariz., assignors to Motorola, Inc., Franklin, Park, Ill.
Filed Nov. 27, 1968, Ser. No. 779,489
Int. Cl. B01j *17/00;* **H01l** *7/12*
U.S. Cl. 29—575 **7 Claims**


11 EPITAXIAL GROWTH
12 OXIDATION
13 BASE REGION MASKING AND ETCHING
14 BASE REGION DIFFUSION
15 EMITTER REGION MASKING AND ETCHING
16 COLLECTOR-BASE MEASUREMENT
17 EMITTER DIFFUSION
18 CONTACT PATTERN MASKING AND ETCHING
19 COLLECTOR-EMITTER MEASUREMENT
20 METALLIZATION
21 DEVICE PROCESSING
24 STRIP LAYERS FROM EPITAXIAL SURFACE
25 PASSIVATE WAFER SURFACES
26 MOUNT WAFER ON CARRIER
27 ETCH EXPOSED WAFER SURFACE
28 POLISH EXPOSED SURFACE
29 REMOVE WAFER FROM CARRIER
TO EPITAXIAL GROWTH

A method of processing semiconductor wafers wherein wafers having epitaxial layers containing diffusion regions which have been rejected due to electrical failures or visual defects can be economically processed and reclaimed for further device fabrication. The method utilizes the combination of an epitaxial layer and an overlying oxide layer to essentially eliminate auto-doping by impurities diffused or contained therein during subsequent fabrication steps.

3,559,282
METHOD FOR MAKING THIN SEMICONDUCTOR DICE
Israel A. Lesk, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill., a corporation of Illinois
Original application Apr. 25, 1967, Ser. No. 633,631, now Patent No. 3,445,925, dated May 27, 1969. Divided and this application Sept. 3, 1968, Ser. No. 798,209
Int. Cl. B01j *17/00;* **H01l** *1/16, 1/24, 7/68*
U.S. Cl. 29—577 **3 Claims**

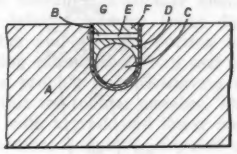


A process for making thin semiconductor devices wherein the semiconductor wafer starting material is initially lapped to a very thin value. Glass and a dummy substrate are then sandwiched to the wafer for further processing and to prevent breakage of the wafer when semiconductor devices such as transistors are constructed therein. Then the glass and dummy substrate are removed, leaving thin semiconductor dice having a very low thermal resistance to heat emanating from PN junctions therein.

3,559,283
METHOD OF PRODUCING AIR-ISOLATED INTEGRATED CIRCUITS
Bernard L. Kravitz, Queens, N.Y., assignor to Dionics Incorporated, Westbury, N.Y.
Filed June 16, 1969, Ser. No. 833,559
Int. Cl. B01j *17/00;* **H01l** *5/00, 7/10, 7/48, 7/12, 7/54*
U.S. Cl. 29—578 **6 Claims**

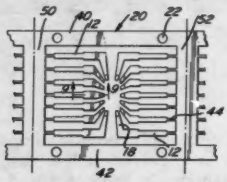
Islands of dielectrically isolated monocrystalline silicon, fabricated in a polycrystalline base, are first produced. Device fabrication and beam lead interconnection follow. Thereafter the planar top surface is covered with an etch-resistant wax and the polycrystalline base is removed by etching. In another embodiment, SiO_2 is grown on a grooved, monocrystalline silicon slice, and polycrystalline silicon is deposited thereover. The slice is then lapped down on the top side so that the polycrystalline silicon and SiO_2 form barriers. Second side is lapped *after* devices are fabricated and after beam leads are formed. Active devices and beam leads are fabricated on one surface, and the polycrystalline material is lapped and etched away from the back. In either case, the remaining structure is an air-isolated beam lead device.

3,559,284
METHOD OF MANUFACTURING MAGNETIC STORE ARRANGEMENTS
Hans Wilhelm Neuhaus, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of application Ser. No. 514,225, Dec. 16, 1965. This application Mar. 7, 1969, Ser. No. 806,050
Claims priority, application Germany, Dec. 17, 1964, P 35,709
Int. Cl. H01f *7/06*
U.S. Cl. 29—604 **10 Claims**



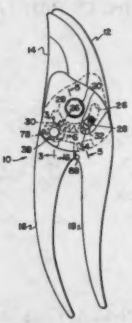
An improved method of fabricating a magnetic storage array comprises the steps of forming a plate of synthetic material having grooves in at least one surface, spraying a molten ferrite material into the grooves so as to cover the entire surface of the grooves, placing a prefabricated cable of matrix wires in the grooves, filling the spaces between the cable and groove walls with a temperature-resistant lacquer to produce a flat surface within the grooves, and spraying a molten ferrite material over the lacquer surface to produce a covering ferrite layer that extends up to, and in contact with, the walls of the grooves, thereby producing a substantially closed magnetic path about the cable. The ferrite wall layers, or the ferrite covering layer, or both, are composed of a material having a square loop hysteresis property.

3,559,285
METHOD OF FORMING LEADS FOR ATTACHMENT TO SEMI-CONDUCTOR DEVICES
John Edward Kauffman, Beth Ayres, Pa., assignor to The Jade Corporation, Beth Ayres, Pa.
Continuation-in-part of application Ser. No. 653,890, July 17, 1967. This application Jan. 8, 1968, Ser. No. 789,857
Int. Cl. H01r 9/00
U.S. Cl. 29—630 7 Claims



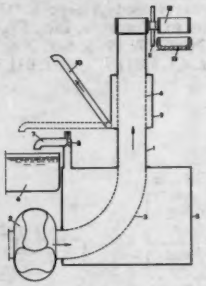
A method of attaching leads to a semi-conductor device includes the steps of inlaying a contacting metal compatible with a semi-conductor element along a metal strip, upsetting the metal strip at spaced portions therealong so as to provide a depression on one side and an upstanding portion on the opposite side of the metal strip, removing the upstanding portion so that the inlay and strip is substantially reduced in thickness at said spaced portions, and then stamping the strip at said spaced portions to define the integral cantilever leads having the contacting metal on their exposed ends.

3,559,286
CUTTING SHEAR
Arthur K. Pfaffenbach, Watertown, Wis., assignor to McGraw-Edison Company, Elgin, Ill.
Filed May 8, 1968, Ser. No. 727,648
Int. Cl. B26b 13/16
U.S. Cl. 30—261 13 Claims



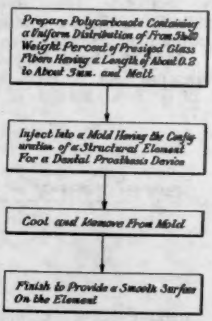
In a cutting shear having pairs of blades and handles pivoted to one another across mutually sliding body portions, a lock mechanism including opposed locking and releasing elements mounted reciprocably in respective body portion openings that become aligned with one another when the blades are closed to permit depression of the locking element into interfering engagement within the adjacent body portion opening which simultaneously shifts the releasing element outwardly for its subsequent depression to release the locking element, and detent means for releasably holding the elements as set.

3,559,287
APPARATUS FOR DRAINING CURD IN MAKING CHEESE
Armand François Bronkhorst, Doorn, Netherlands, assignor to Holvrieka International N.V., Utrecht, Netherlands, a corporation of the Netherlands
Filed Nov. 21, 1968, Ser. No. 777,839
Claims priority, application Netherlands, Nov. 27, 1967, 6716103
Int. Cl. A01j 25/00, 25/12
U.S. Cl. 31—46 3 Claims



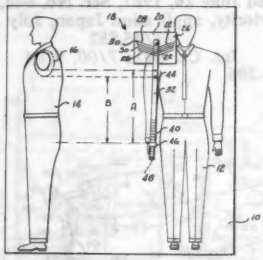
An apparatus for draining curd in making cheese comprising a riser tube consisting of one or more successive sections with perforated walls to subject a whey-curd composition to a ready pre-drainage and an accurately controllable after-drainage so as to make for a just control of the ultimate result.

3,559,288
DENTAL FILLINGS AND DEVICES COMPOSED OF A POLYCARBONATE FILLED WITH PRESIZED GLASS FIBERS
Hans-Joachim Rehberg, Leverkusen, Hermann Schnell, Krefeld, Wilhelm Hechelhammer, Krefeld-Bockum, and Hugo Streib, Krefeld-Urdingen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany, a corporation of Germany
Continuation of application Ser. No. 472,057, July 14, 1965. This application July 16, 1969, Ser. No. 846,638
Claims priority, application Germany, July 15, 1964, F 43,440
Int. Cl. A61c 13/00
U.S. Cl. 32—2 13 Claims


Prepare Polycarbonate Containing a Uniform Distribution of From 5to40 Weight Percent of Presized Glass Fibers Having a Length of About 0.2 to About 3mm. and Melt
Inject Into a Mold Having the Configuration of a Structural Element For a Dental Prosthesis Device
Cool and Remove From Mold
Finish to Provide a Smooth Surface On the Element

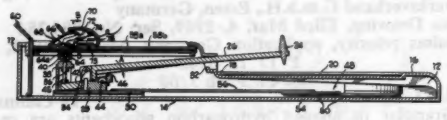
A dental filling or dental prosthesis device having an essential structural element composed of a thermoplastic, high molecular weight polycarbonate and from 5 to 40 percent glass fibers presized with a thermoplastic, high molecular weight polycarbonate or water and a method of making same.

3,559,289
GARMENT SLEEVE INNER SEAM MEASURING DEVICE
Theodore Yonkler, Bronx, N.Y., assignor to The Photometric Corporation, New York, N.Y., a corporation of Delaware
Filed Feb. 17, 1969, Ser. No. 799,696
Int. Cl. A41h *1/00*
U.S. Cl. 33—16 14 Claims



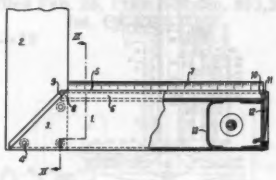
A device for measuring the sleeve inner seam length of a garment from a graphic representation of a person to be fitted in which a transparent plate carries respective pluralities of parallel indicator lines extending in opposite directions from a common line at slopes corresponding to the right and left shoulder slopes of a standard garment pattern and having lengths corresponding to the lengths of the shoulder seams of standard patterns for various sizes. A transparent arm pivoted on the plate at a point lying on an extension of the common line has a scale which increases in a direction away from the arm pivot from a zero point located at a point on the arm corresponding to the location of the bottom of a garment armhole measured from the intersections of the indicator lines with the common line. By use of the device a precise measurement of the sleeve inner seam of a garment can be obtained. In addition, the adequacy of the armhole and of the shoulder seam lengths can be checked.

3,559,290
TRACING DEVICE
Marvin I. Glass and Rouben T. Terzian, Chicago, Ill., assignors to Marvin Glass & Associates, a partnership
Filed Aug. 27, 1969, Ser. No. 853,269
Int. Cl. B41i *13/10*
U.S. Cl. 33—23 3 Claims



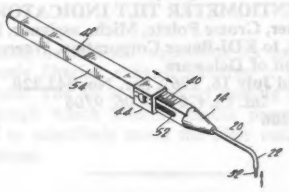
A tracing device which includes a tracing element mounted on a base structure for free movement to trace characters on a workpiece, and an image forming member movable in response to movement of the tracing element to reproduce an image of the traced characters onto a blank. The image forming member is disposed beneath the blank and a simulated live object, such as a small animal form, is positioned on top of the blank and moves with the image forming member by means of a pair of magnetic members mounted on the object and the image forming member. The blank comprises a laminated pressure sensitive structure which permits erasing the reproduced image on separation of the laminated layers thereof.

3,559,291
TRY-SQUARE
André Quenot, Besancon, France, assignor to Quenot & Cie S.a.r.l., Zone Industrielle Trepillot, Besancon, France, a company of France
Filed Feb. 18, 1969, Ser. No. 797,885
Claims priority, application France, Apr. 22, 1968, 148,906
Int. Cl. B43l *7/02*; G01b *3/04*
U.S. Cl. 33—113 3 Claims



A try-square has a stock, a first blade extending perpendicular to the stock and a second blade set in a slot extending along the upper edge of the stock in the same plane as the first blade.

3,559,292
DENTAL GAUGE
Bernard Weissman, 304 Ashland Place, Brooklyn, N.Y. 11217
Filed July 16, 1968, Ser. No. 745,320
Int. Cl. G01b *3/28*
U.S. Cl. 33—169 1 Claim

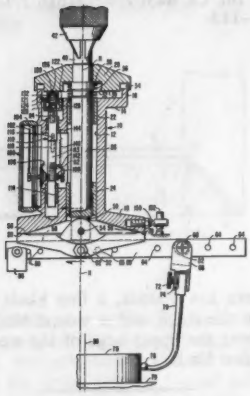


A dental gauge comprising an elongated body member within which is contained a tubular member, a minor portion of the tubular member being disposed within the body member and a major portion of the tubular member extending externally thereof and terminating in a curved end, a probing member having a probing tip is positioned within the tubular member. The body member is provided with a graduated linear measuring scale and a sliding member is slidably disposed over the body member and secured to said probing member internally of said body member whereby the sliding member is operative to slide over the measuring scale in conjunction with the movement of the probe so that the measurement of the probe is directly readable on the measuring scale in dependence on the position of the sliding member.

3,559,293
INDICATOR DEVICE
John L. Blake, 419 E. Live Oak Ave., Arcadia, Calif. 91006
Filed Feb. 5, 1969, Ser. No. 796,828
Int. Cl. G01b *3/22*
U.S. Cl. 33—172 8 Claims

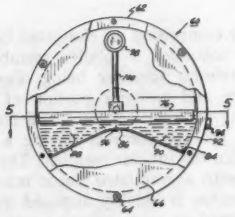
An indicator device is disclosed for locating a workpiece on a machine tool and includes a housing enclosing a rotatable shaft and movable linearly relative thereto in proportion to the deflection of a feeler element carried

by the shaft for engagement with a surface of the workpiece. An actuating member transmits the relative linear movement between the housing and shaft to a dial indicator carried by the housing. The actuating member



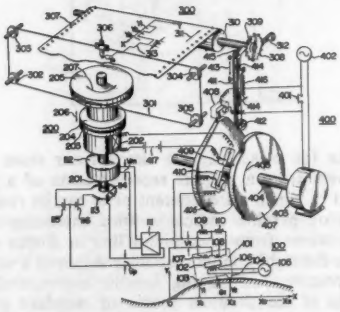
includes first and second portions resiliently biased to a limiting relative position under a preload to protect the dial indicator transmission from shock loads above a minimum level applied to the feeler element.

3,559,294
POTENTIOMETER TILT INDICATOR
Russell E. Bauer, Grosse Pointe, Mich., assignor, by mesne assignments, to KDI-Bauer Corporation, Warren, Mich., a corporation of Delaware
Filed July 16, 1969, Ser. No. 842,228
Int. Cl. G01c *9/06, 9/08*
U.S. Cl. 33—206 **5 Claims**



A tilt indicator having a partially liquid filled housing is provided with a potentiometer fixably mounted therein and connected in an appropriate electrical circuit. A shaft extending from a slider contact of the potentiometer has fixably secured thereto a pair of arms extending outwardly normal to the shaft, each of which has a float mounted thereon. As the indicator is tilted the liquid and floats remain in the same position relative to the earth and the slider contact moves with respect to the potentiometer resistor creating an output voltage which can be correlated to the angle of tilt of the indicator. In one embodiment a counterweight extending normally to the shaft and arms in a direction away from the liquid provides stabilization of the shaft and float assembly during periods of acceleration and the like. In a second embodiment, the liquid associated with the undersides of each float is separated into two chambers, connected by means of a passageway which restricts the displacement of the fluid from one chamber to the other and thereby stabilizing the shaft and float assembly during periods of acceleration and the like.

3,559,295
DEVICE FOR MEASURING INCLINATION
Yasuo Iwafune, Tokyo, Japan, assignor to Tokyo Optical Company Limited, Tokyo, Japan
Filed June 26, 1967, Ser. No. 648,924
Claims priority, application Japan, July 12, 1966, 41/45,552
Int. Cl. G01c *7/00, 9/04*
U.S. Cl. 33—206 **2 Claims**



A device for measuring inclination for use in measuring the inclination along straight portions of a machine such as a bed surface thereof, comprising a detector means including an instrument having two connected points, an indicator means including a recording pen in contact with a record sheet, a clutch means. The device is a programming means, and constructed and arranged such that the values measured by the two connected points can automatically be integrated and recorded in succession on the record sheet thus showing the deviation from the horizontal thereon.

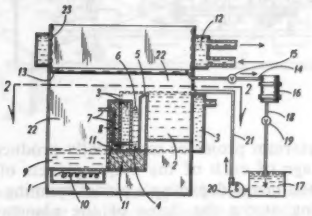
3,559,296
PROCESS FOR THE REGENERATION OF HYDROCARBON ADSORBENTS
Heinrich Dratwa, Rheinhausen, Gunter Gappa, Gelsenkirchen-Buer, and Harald Juntgen, Martin Kruel, and Jurgen Schwarte, Essen, Germany, assignors to Bergwerksverband G.m.b.H., Essen, Germany
No Drawing. Filed Mar. 4, 1969, Ser. No. 804,284
Claims priority, application Germany, Mar. 5, 1968, P 17 19 554.9
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **12 Claims**

Granular or shaped hydrocarbon adsorbents are regenerated by subjecting the adsorbent to a heat treatment in contact with a hot solid heat exchanger.

3,559,297
PROCESS AND APPARATUS FOR REMOVING WATER FROM SOLID SURFACES
Francis J. Figiel, Boonton, N.J., assignor to Allied Chemical Corporation, New York, N.Y., a corporation of New York
Filed Mar. 10, 1969, Ser. No. 805,561
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **15 Claims**

Process for removing water from a non-absorbent article comprises maintaining a boiling bath and a non-boiling bath of solvent which is heavier than water and

in which water is about .1–5% by weight soluble, immersing the article to be treated into the non-boiling bath to displace water therefrom, causing the displaced water and solvent to overflow into a separation zone wherein water is removed from the system and solvent is transferred to the boiling bath, withdrawing the article from the non-boiling bath and exposing it to contact with the vapors of the solvent generated by the boiling solvent bath. A preferred solvent is an azeotropic mixture of about 97 weight percent 1,1,2-trichloro-1,2,2,-trifluoro-



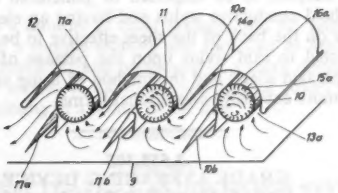
ethane and about 3 weight percent isopropanol. Apparatus comprises a dewatering sump, equipped with cooling means, positioned adjacent a water separating sump equipped with cooling means, which water separating sump collects water and solvent liquid which overflows from the dewatering sump, means for removing water from the water separating sump, a boiling sump, means for transferring solvent liquid from the water separating sump to the boiling sump, means for condensing solvent vapors generated in the boiling sump and cycling same to the non-boiling sump.

3,559,298

METHOD FOR DRYING OR HEATING OR COOLING A PROCESS MATERIAL AND A DEVICE FOR CONDUCTING SUCH METHOD

Horst Theilemann, Rudesheimer Strasse 11, Munich, Germany, and Kurt Zenkner, Hertzstrasse 12, Ettlingen, Germany

Filed Sept. 5, 1968, Ser. No. 757,635
Int. Cl. F26b *5/04*
U.S. Cl. 34—15 **14 Claims**



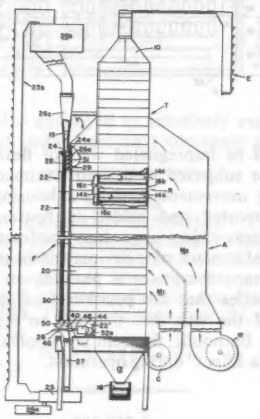
A band or web of material or a layer of material carried on a band is treated by exposing the surface of the material while passing it through a treatment chamber to jets or a current of air, the jets impinging on the surface and forming a flow traveling along the surface of the material. The flow is repeatedly interrupted on its course and then reformed by producing an instability in the flow, as by the use of spoilers. The flow may be produced by cross-flow blowers with their axes parallel to the surface of the material, discharging directly into the surface of the material. The outlet of the blowers is varied by movable flaps.

3,559,299

GRAIN DRYER AND METHOD OF DRYING GRAIN

Duane W. Tyler, Danville, Ill., assignor to J. P. Burroughs & Son, Inc., Saginaw, Mich., a corporation of Michigan

Filed Feb. 28, 1969, Ser. No. 803,367
Int. Cl. F26b *7/00*
U.S. Cl. 34—19 **26 Claims**



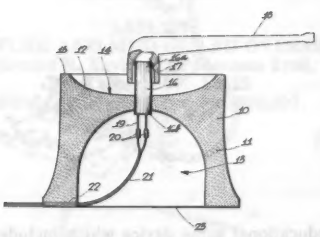
A filtering method and apparatus for grain dryers for continuously filtering exhaust air after it has been used to dry grain. The air is filtered by passing through a column through which filtering media passes. Means are provided to selectively move the filter media relative to the air stream.

3,559,300

TOBACCO PIPE DRYER

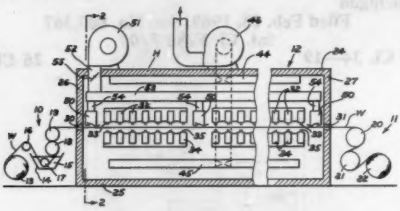
Lloyd G. Fox, 217 Wilson Road, Welland, Ontario, Canada

Filed Feb. 7, 1969, Ser. No. 797,478
Int. Cl. F26b *25/00*
U.S. Cl. 34—104 **5 Claims**



The invention relates to a tobacco pipe dryer comprising a one-piece stand having a cylindrical heating device mounted therein, one end portion of the heating device projecting above a dished upper surface of the stand for reception of a pipe bowl and the other end portion being disposed in a recess in the stand with means for connecting it to a source of electric power.

3,559,301
AIR FLOTATION SYSTEM FOR CONVEYING WEB MATERIALS
William A. R. Fraser, Belle Mead, N.J., assignor to Egan Machinery Company, Somerville, N.J., a corporation of New Jersey
Filed July 29, 1968, Ser. No. 748,319
Int. Cl. F26b *13/20*
U.S. Cl. 34—156 14 Claims

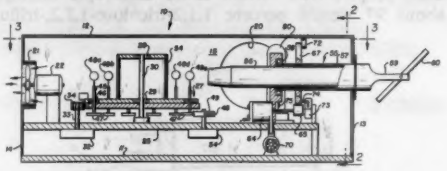


A coated or impregnated web of flexible material is conveyed or subjected to desired treatment, such as drying, during movement through a housing in which the web is supported and guided in floating condition by support means using a gaseous medium and is maintained out of contact with devices within the housing. The support means comprises a plurality of spaced, novel, support nozzles that are positioned adjacent and across one side of the web and that are so constructed as to utilize the Bernoulli theorem as applied to gases and the "Coanda Effect" during operation.

3,559,302
EDUCATIONAL GAME DEVICE TO IMPROVE TYPING SKILL
Ruben C. Little, 7800 SW. 52nd Court, South Miami, Fla. 33134
Filed July 18, 1968, Ser. No. 745,932
Int. Cl. G09b *13/00*; A01m *23/24*; A63b *67/00*
U.S. Cl. 35—5 10 Claims

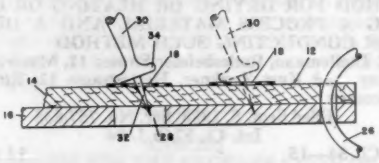
An educational game device which includes a gripping jaw type trap assembly with spring means to normally close the jaws and detent means to hold the jaws open against the bias of a spring which includes trip means to trip the detent means in bringing the jaws together under the urging of the spring, the jaws having a finger receiving opening for access to the trip means through which players extend their fingers to trip the mechanism and close the jaws.

3,559,303
PLANET SEQUENCE PROJECTOR
James D. Vickery, 670 Garland St., Lakewood, Colo. 80215
Filed Jan. 3, 1969, Ser. No. 788,906
Int. Cl. G09b *27/00*
U.S. Cl. 35—42.5 10 Claims



A planetarium projector sequentially produces an individual image of each of the major planets of the solar system, each image depicting a planet spinning on its axis and moving across the dome of the planetarium. The projector system includes a turntable having a series of scale models mounted on rotatable shafts mounted on the table, and the table is arranged to sequentially index each of the models into a position in front of the projection lens system and into light path for projecting an opaque projection onto a pivoted mirror which moves the image across the planetarium dome.

3,559,304
APPARATUS FOR TEACHING
Patrick A. Kane, Hartline, Wash. 99135
Filed June 5, 1968, Ser. No. 734,797
Int. Cl. G09b *5/02*
U.S. Cl. 35—48 4 Claims

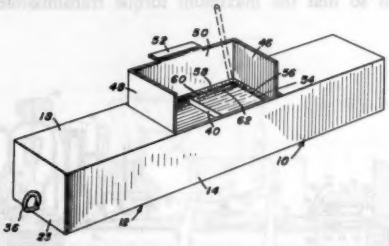


An inexpensive throw-away answer sheet of opaque material adapted to be dispersed or punctured easily by a hand-held conductive stylus and having an electrical conductor on the back of the sheet effective to be electrically connected to said stylus upon the passage of said stylus through said sheet; and the method of using same to conserve more expensive educational forms.

3,559,305
GRADE AVERAGING DEVICE
Clyde S. Mundell, R.D. 1, Box 107, Carmichaels, Pa. 15320
Filed July 23, 1969, Ser. No. 843,936
Int. Cl. G09b *23/00*
U.S. Cl. 35—48 9 Claims

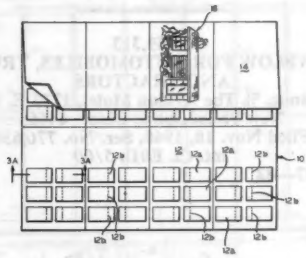
An averaging device including a housing enclosing vertically stacked elongated horizontal panels individually supported for longitudinal forward advancement from a first storage position through a second viewing position. The rear edge portion of each panel and the front edge portion of the next lower panel include coacting structure for forwardly advancing each of the lower panels in train

fashion behind the next upper panel as that upper panel is forwardly advanced past the viewing position with its rear edge portion vertically registered with the front edge portion of the next lower panel and the panels may thus be successively advanced in train fashion through the



viewing position. The housing includes first indicia spaced along the viewing position and second indicia at the viewing position spaced along a line disposed normal to the direction of the advancement of the panels with which the upper viewable surfaces of the panels are registrable.

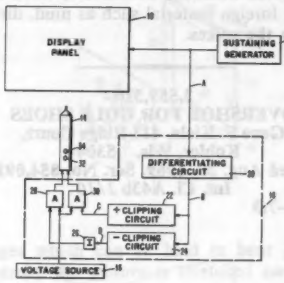
3,559,306
SELF-CONTAINED COLOR DISPLAY
Robert E. Winans, 251 Cady Drive, Palatine, Ill. 60067
Filed Oct. 24, 1968, Ser. No. 770,364
Int. Cl. G09b *25/00*
U.S. Cl. 35—53 **3 Claims**



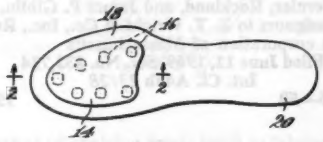
Includes a number of color samples that are removably attached to a sample section, and they can be selectively detached therefrom and positioned in a color displayer or illustrative section to aid in the selection of colors for the exterior painting of a house, or the like.

3,559,307
STYLUS ACTUATED GAS DISCHARGE SYSTEM
Euval S. Barrekette, New York, and Herbert B. Baskin, Mohegan Lake, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York
Filed May 26, 1969, Ser. No. 827,598
Int. Cl. B43l *1/00*
U.S. Cl. 35—61 **9 Claims**

A display system including a gas discharge display panel made up of an assembly of glass films enclosing a gas and including electrodes that define an array of discrete cells. A source of sustaining voltage is applied to the electrodes to maintain the gas slightly below a threshold value. A hand held stylus which produces a high voltage discharge is connected to the source of sustaining voltage and is employed to selectively excite the cells which then emit visible light until selectively extinguished.

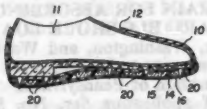


3,559,308
CLEATED OUTSOLE
Louis E. Bernier, Rockland, and James P. Giblin, Milton, Mass., assignors to E. T. Wright & Co., Inc., Rockland, Mass., a corporation of Massachusetts
Continuation-in-part of application Ser. No. 831,373, June 9, 1969. This application Sept. 17, 1969, Ser. No. 858,740
Int. Cl. A43b *23/28*
U.S. Cl. 36—2.5 **8 Claims**



A cleated outsole having at its inner side a raised platform layer of such configuration and thickness as to fit into and substantially fill the cavity at the bottom of a welt lasted shoe in place of the conventional filling material and a plurality of cleats fixed to the outsole, each cleat having a relatively large head buried in the raised platform and a stem extending therefrom through the outsole and through the tread surface thereof.

3,559,309
MOISTURE AND MUD GUARD OVERSHOE
Clarence R. Taylor, 75 Panorama Trail, Rochester, N.Y. 14625
Filed Feb. 24, 1969, Ser. No. 801,307
Int. Cl. A43b *1/10*
U.S. Cl. 36—7.3 **5 Claims**



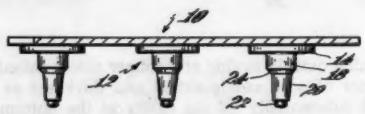
A moisture and mud guard overshoe mountable on a sport shoe of the type having spikes, such as a golf or baseball shoe. The overshoe is constructed of thin, strong

rubber, plastic, or any other suitable material that may be readily pierced by the spikes when weight is applied to the shoe. The overshoe further has a resilient inner-sole of a material which is also readily pierced by the spikes, and which serves when the overshoe is worn to wipe or clean off any foreign material such as mud, dirt, grass or the like from the spikes.

3,559,310
OVERSHOE FOR GOLF SHOES
Gene F. Kiela, 411 Ridge Court, Kohler, Wis. 53044
Filed Aug. 29, 1969, Ser. No. 854,091
Int. Cl. A43b *1/10*
U.S. Cl. 36—7.3 **6 Claims**

An overshoe for application over a golf shoe or the like having spikes projecting downwardly from the shoe sole. The overshoe has a sole with complementary hollow spikes bonded thereto and which interlockingly, telescopically receive the shoe spikes. The overshoe is worn during inclement weather and is foldable to facilitate storage when not in use.

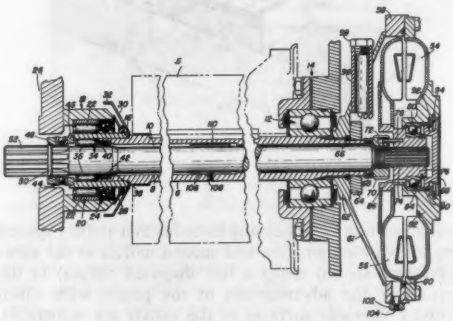
3,559,311
GOLF SHOES
Louis E. Bernier, Rockland, and James P. Giblin, Milton, Mass., assignors to E. T. Wright & Co., Inc., Rockland, Mass., a corporation of Massachusetts
Filed June 12, 1969, Ser. No. 832,724
Int. Cl. A43b *23/28*
U.S. Cl. 36—59 **15 Claims**



A cleat plate and cleats for use in the manufacture of golf shoes characterized in that the cleats are designed to last for the life expectancy of the shoe, and to a method of incorporating the plates and cleats in the shoe bottom by assembly with a preformed outsole or incorporation in an outsole formed by compression or injection molding processes. Also a golf shoe with a cleated bottom designed to be effective throughout the normal life of the shoe.

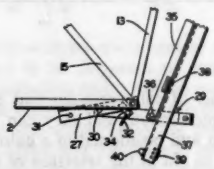
3,559,312
DRIVE TRAIN FOR ABSORBING HIGHLY VARIABLE SHOCK LOADS
Charles H. Fox, Washington, and Wayne H. McGlade, Peoria, Ill., assignors to Westinghouse Air Brake Company, a corporation of Pennsylvania
Continuation of application Ser. No. 522,430, Jan 24, 1966. This application July 25, 1969, Ser. No. 847,804
Int. Cl. B60p *1/36;* **H02h** *7/08*
U.S. Cl. 37—8 **4 Claims**

A drive train is provided having sufficient flexibility to absorb high variable shock loads such as those encountered in the driving of the elavting conveyor of a self-loading scraper. This is accomplished by means of a hollow shaft and a second shaft disposed in the bore of the hollow shaft, with the torque source (an electric motor) drivingly connected with one of the two shafts and the conveyor driven by the other of the two shafts, the two shafts being connected by means of a flexible element such as a fluid coupling, the coupling and the motor being matched so that the maximum torque transmissible by



the fluid coupling is greater than the locked-rotor torque of the motor and is less than the maximum torque output of the motor, whereby the coupling stalls without stalling the motor. A fusible plug in the coupling melts to allow the escape of coupling fluid and unload the motor before the motor destroys itself through overheating. A bushing between the shafts keeps them aligned and is slotted to provide passage means to allow oil from the coupling to flow the length of the hollow shaft for lubrication.

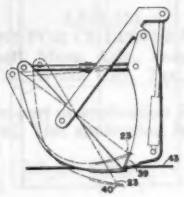
3,559,313
SNOWPLOW FOR AUTOMOBILES, TRUCKS AND TRACTORS
Max Firestone, % The Avalon Motel, 1733 E. High Ave., New Philadelphia, Ohio 44663
Filed Nov. 18, 1968, Ser. No. 776,630
Int. Cl. E01h *5/00*
U.S. Cl. 37—42 **4 Claims**



A snowplow for attachment to an automobile or other vehicle having a frame carrying runners at its forward end. A blade is hingedly mounted upon the runners which extend beneath and in front of the blade. One runner is directly attached to the frame and the other runner is connected to the frame by an adjusting lever for angling the blade.

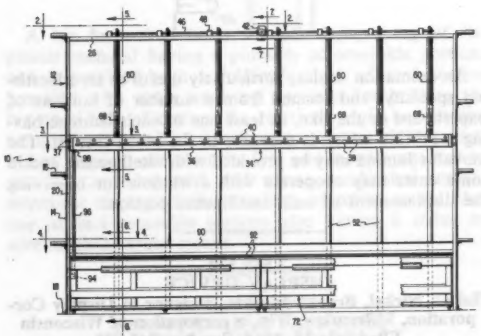
There are rigid pins depending from the rear end of the frame and adapted to be inserted through apertures in brackets fixed upon a suitable portion of the vehicle such as the front bumper of an automobile. Means is provided for preventing accidental removal of the pins from the brackets.

3,559,314
BUCKET ATTACHMENT FOR BULLDOZER BLADES AND THE LIKE
John H. Funk, General Delivery, Prairie Grove, Manitoba, Canada
Filed Sept. 16, 1968, Ser. No. 759,988
Int. Cl. E02f *3/76*
U.S. Cl. 37—117.5 3 Claims



A bucket attached to a bulldozer blade by actuating arms extending from the upper sides of said blade to points substantially midway between the upper and lower edges of the bucket and stabilizer arms between the upper edge of the bucket and the upper edge of the blade to control the pivotal characteristics of the bucket when actuated.

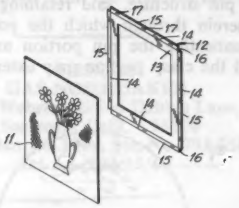
3,559,315
SIZER FOR DRAPERIES
James D. Christensen, Maitland, Fla. (% Florida Decorators Inc., 1126 Solana Ave., Winter Park, Fla. 32789)
Filed Apr. 23, 1969, Ser. No. 818,721
Int. Cl. D06c *3/08*
U.S. Cl. 38—102.3 8 Claims



A sizer for draperies and other material including an open upright frame, a movable clamp bar on the frame, a drive sheave and cable arrangement for raising the clamp bar, and a frame mounted drive motor for operating the sheave and cable arrangement. The material is supplied on movable work tables and is withdrawn and raised by elevating of the clamp bar.

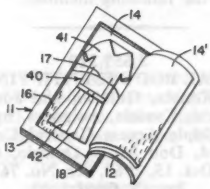
3,559,316
PICTURE STRETCHER
Samuel Galper, 224—42 Kingsbury Ave., Flushing, N.Y. 11364
Filed Aug. 6, 1969, Ser. No. 847,902
Int. Cl. D06c *3/08*
U.S. Cl. 38—102.91 6 Claims

A picture stretcher of relatively thin material, such as paperboard, for mounting and stretching a canvas picture which is integrally formed with a central area substantially the size of the completed picture and outwardly extending portions having the edges of the picture secured thereto in flat condition and bendable about score lines to



form flanges which can be held in bent position by a frame whereby the picture is stretched and held in the stretched position.

3,559,317
METHOD AND APPARATUS FOR APPLYING FABRIC FINISHES TO GARMENTS
Lillian L. Knight, Morris Plains, and Julie A. Lapham, Denville, N.J., assignors to The Singer Company, New York, N.Y., a corporation of New Jersey
Filed June 30, 1969, Ser. No. 837,486
Int. Cl. D06f *67/04*
U.S. Cl. 38—144 5 Claims

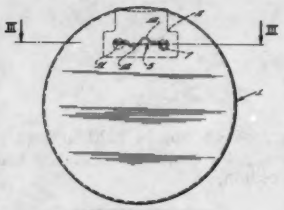


A method of applying fabric finish to fabricated articles such as garments is disclosed in which the article is treated with a chemical by being placed within a closed liquid impervious bag containing a porous material to which the chemical has been applied, either directly in the case of liquid chemicals, or together with a suitable liquid carrier in the presence of which the chemical will be transferred to the article when it is placed adjacent to the porous material in the closed bag. Steps are disclosed by which a permanent press finish may be applied to garments using the above described method. A garment treating bag is also disclosed having a lining of porous material which may be saturated with liquid chemicals for treating fabric garments in the practice of the method of this invention.

3,559,318
DISPLAY BUTTON
Frank J. Sitzberger, Oak Brook, Ill., assignor to Adcraft Mfg. Co., Chicago, Ill., a corporation of Illinois
Filed Nov. 29, 1968, Ser. No. 779,736
Int. Cl. A44c *3/00*
U.S. Cl. 40—1.5 3 Claims

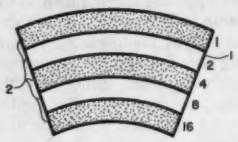
A display button comprising only two separate components, a pin structure by means of which a button may be attached to a garment or other objects, and a button blank, formed from sufficiently rigid sheet material, having a body portion with a peripheral configuration corresponding to the desired shape of the ultimate display button and a pin retaining member integrally connected with and formed from the same sheet material as the body portion, the pin structure, formed from wire stock having

a mounting portion, a pin portion provided with a free pointed end and connected at its opposite end to one end of the mounting portion, the opposite end of the mounting portion having a clasp portion cooperable with the pointed end of the pin structure, said retaining member having openings therein through which the portion of the pin structure connecting the pin portion and the mounting portion, and the clasp portion may extend, said retaining



member being folded back at its connection with the body to adjacent the rear face of the latter with the mounting portion of said pin structure disposed between said retaining member and said rear face. The spaced openings through which the respective portions of the pin extend are preferably connected by an elongated slit of a size to permit passage of the pin portion therethrough whereby it is unnecessary to open the pin structure to effect operative connection with the retaining member.

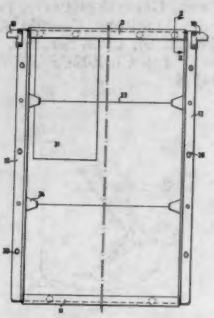
3,559,319
ROTATIONAL BODY IDENTIFYING MEANS
Graeme Scott, Kanata, Ontario, and Joseph Zelikovitz, Ottawa, Ontario, Canada, assignors, by mesne assignments, to Multiple Access General Computer Corporation, Limited, Don Mills, Ontario, Canada
Filed Oct. 15, 1968, Ser. No. 767,634
Int. Cl. G09f *3/02*
U.S. Cl. 40—2.2 **2 Claims**



This invention relates to an article which is to be attached to a rotating body for unique identification thereof. Binary or other coded markings are placed upon an applique base which is applied to the body. The markings are segmental to a circle, and each is of approximately unvarying distance from a point on the axis of rotation of the body. When the body rotates with some speed, any decimal rotation upon the body becomes unreadable, while highly visible rings are produced which can be decoded into a decimal identifying number, unique for the rotating body.

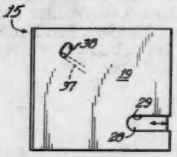
3,559,320
FILM CARRYING FRAMES
Eric Oscar Ohlson, Ankdammsgatan 29, and Karl-Eric Ohlson, Lovgatan 68, both of Solna, Sweden
Filed Jan. 27, 1969, Ser. No. 794,300
Claims priority, application Sweden, Feb. 20, 1968, 2,187/68
Int. Cl. G09f *11/00*
U.S. Cl. 40—106.1 **4 Claims**

A translucent screen is connected to a frame by a series of resilient discs each of which is fixed by a pivot close to an edge of the screen and has at least one boss extending inside an elongated frame element, as well as



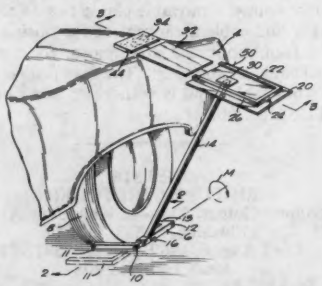
a clamping web adapted to press an X-ray film or the like against the inner surface of the translucent screen.

3,559,321
ANIMATION DEVICE
Charles Robert Helms, Barto, Pa., assignor to Container Corporation of America, Chicago, Ill., a corporation of Delaware
Filed Mar. 28, 1969, Ser. No. 811,465
Int. Cl. G09f *19/02*
U.S. Cl. 40—106.41 **9 Claims**



An animation device, particularly useful as an advertising specialty, and formed from a number of laminae of paperboard or the like, at least one of such laminae having a portion which is movable in the plane thereof. The movable lamina may be provided with intelligence, and in some cases may cooperate with a window for observing the displacement of such intelligence portion.

3,559,322
DISPLAY DEVICE
Hal G. Nickel, Brookfield, Wis., assignor to Display Corporation, Milwaukee, Wis., a corporation of Wisconsin
Filed July 25, 1968, Ser. No. 747,728
Int. Cl. G09f *7/00*
U.S. Cl. 40—129 **8 Claims**

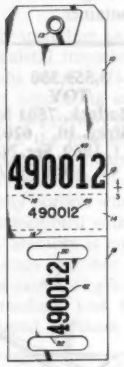


A display device includes a display support plate affixed to a column which extends upwardly from a base.

A copy or indicia bearing member is mounted on the support plate.

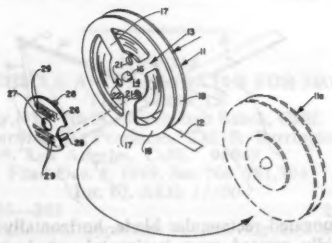
The support base is adjustable to fit beneath a standing vehicle tire and the column extends at an angle to the base such that the entire weight of the column and support plate creates a moment urging the base into engagement with the vehicle tire which supports the entire device.

3,559,323
TAG FOR COTTON BALES
Joseph L. Mitchell, Mesa, Ariz., assignor to Texas Tag & Specialty Co., Wolfe City, Tex., a corporation of Texas
Continuation-in-part of application Ser. No. 659,772, Aug. 10, 1967. This application June 5, 1969, Ser. No. 830,691
Int. Cl. G06b *3/14*
U.S. Cl. 40—305 **6 Claims**



A tag for cotton bales wherein a paper tag of flat pliable material having a plurality of severable portions and is provided with a relatively rigid adhered section provided with strap receiving openings for holding the tag on a bale of cotton, the relatively rigid tag portion being adhesive and ink pervious so as to permit the printing of large numbers on the first and second tags and to provide for substantial and strong mechanical attachments for the tag relative to a bale of cotton or the like; one of said severable sections also having a string or wire receiving eyelet means.

3,559,324
TRANSFERABLE TAPE REEL IDENTIFICATION DISK
Charles S. Blair, % 5th Ave. Rental, 101 5th Ave., Redwood City, Calif. 94061
Filed May 27, 1968, Ser. No. 732,132
Int. Cl. G09f *3/00*
U.S. Cl. 40—309 **1 Claim**



Transfer of data identifying material recorded on tapes for recorders is accomplished by this invention when the tapes are wound from one reel to another. A disk carries the identifying indicia and is provided with means detachably securing same to a reel so that when a tape is transferred from one reel to another the disk may be conveniently removed from the first reel and installed on the second.

3,559,325
GAS NOISEMAKER
John Webster, 20566 Debbie Lane, Saratoga, Calif. 95070
Filed Jan. 16, 1969, Ser. No. 791,758
Int. Cl. F41c *3/02*
U.S. Cl. 42—55 **12 Claims**

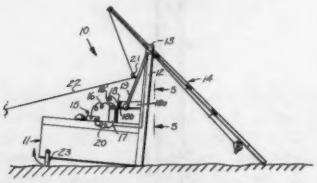
A noisemaker which makes acetylene gas from calcium carbide and explodes the gas, when a fuse is ignited, all in a cardboard, plastic or other lightweight tube having a captive missile or cap at one end that is ejected at the time of the explosion.

3,559,326
HOOK SETTER
Clifford W. Henderson, 3804 Greenway Place, Shreveport, La. 71105
Filed Jan. 13, 1969, Ser. No. 790,625
Int. Cl. A01k *97/00, 97/12*
U.S. Cl. 43—15 **3 Claims**

A device comprising a length of wire forming two elongated legs joined by a spring loop to provide spring tension to the legs. The end of one leg has a first loop and a transverse finger thereon and the other leg has a latch arm pivoted at its center to the end thereof. The latch arm has a second loop on one end and a downwardly-extending finger on the other end. The first leg

has means thereon for storing fishing line and a portion of the line extends through both loops on the legs and is provided with a hook at its free end. When the legs are brought together, the fingers are engaged to set the device, and when a fish bites, the fingers are disengaged and the legs spring apart to set the hook in the fish's mouth.

3,559,327
FISH WARNING DEVICE
Bernard A. Christopher, Wilkes-Barre, Pa., assignor of twenty-five percent each to Chester Baczynski, James Bartoletti and Chris Featherstone, all of Wilkes-Barre, Pa.
Filed Dec. 2, 1968, Ser. No. 780,412
Int. Cl. A01k *97/12*
U.S. Cl. 43—17 **2 Claims**



An apparatus for signaling the movement of a fishing line of a fishing rod by the pull of a fish has a pendulum pivotally attached to and hanging freely from an upwardly extending member. The fishing line passes from the fishing rod, through a hook attached to the pendulum and into a body of water. The pull of a fish on the fishing line causes the pendulum to swing and touch a contact bar to close an electrical circuit and activate a signal, such as a bell.

3,559,328
LINE-CASTER ATTACHMENT FOR FISHING ROD
Royal B. Lesher, Spenard, Alaska
(3200 W. 29th Turnagain 3., Anchorage, Alaska 99503)
Filed Dec. 24, 1968, Ser. No. 786,697
Int. Cl. A01k *91/02*
U.S. Cl. 43—19 **8 Claims**

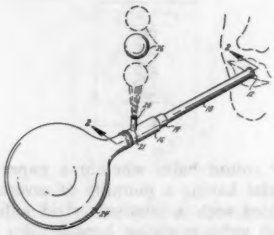
A manually actuable self-contained automatic caster attachment which can be readily mounted on a casting rod without altering said rod and where there is insufficient room for a backcast. A bendable spring steel or equivalent strip member is provided with guide eyes and a tip-end-eye for the lure-equipped fishing line. When the strip member is bent back, it is momentarily cocked by a novelly mounted pull-string. When the angler releases the suitably tautened string, the momentum imparted to the fishing line carries the line and lure out over the water.

3,559,329
BAG WITH ONE-WAY ENTRANCE
Winton C. Chiu, 1901 E. 23rd St., Oakland, Calif. 94606
Filed Feb. 28, 1969, Ser. No. 803,311
Int. Cl. A01k *97/04*
U.S. Cl. 43—55 **1 Claim**

A bag, container or the like having a closure associated with an opening therein with the closure incorporating a one-way entrance in the form of a conical member having an open apex depending into the bag, container or the like with the conical member being constructed from a

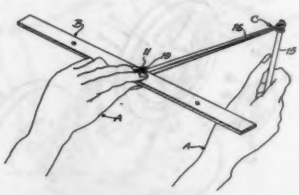
peripherally expandible member to enable the open lower apex thereof to expand when entry from above is desired but remain closed when egress is attempted from the interior of the bag or container.

3,559,330
TOY
Marvin L. Matlock, 7501 Mars Drive, Godfrey, Ill. 62035
Filed Apr. 11, 1969, Ser. No. 815,318
Int. Cl. A63h *29/16*
U.S. Cl. 46—44 **8 Claims**



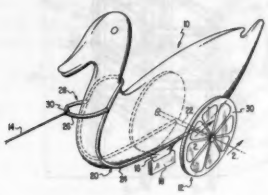
A toy has a chamber, a mouth piece through which air can be supplied to said chamber, a balloon which receives air from said chamber and thereafter returns air to said chamber, a nozzle which extends upwardly from said chamber to direct a jet of air upwardly, and a light-weight ball which can be suspended in mid air by said jet of air.

3,559,331
CATAPULT POWERED RECTANGULAR BLADE
Pernell D. Eller, 1331 Washington Blvd., Venice, Calif. 90291
Filed Apr. 21, 1969, Ser. No. 817,991
Int. Cl. A63h *27/00*
U.S. Cl. 46—74 **3 Claims**



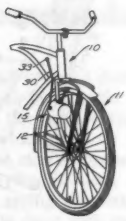
An elongated rectangular blade, horizontally projected and rapidly rotated on a horizontal axis by an elastic catapult, is thereby caused to soar on a rising trajectory until its spinning momentum is dissipated.

3,559,332
PULL-TOY ASSEMBLY
Robert A. Stephens, 2980 Risinger Drive, Shreveport, La. 71102
Continuation-in-part of application Ser. No. 680,168, Nov. 2, 1967. This application Aug. 11, 1969, Ser. No. 848,933
Int. Cl. A63h *3/06*
U.S. Cl. 46—88 4 Claims



A pull-toy assembly including an inflatable body member and a wheeled skeletal framework wherein assembly and disassembly of the same is facilitated by providing distinct body member supporting and encircling portions on said framework for supporting and encircling separate and distinct portions of the inflatable body member and wherein the inner periphery of the body encircling portion of the framework exceeds the outer periphery of the encircled inflatable body portion whereby the pull-toy may be assembled and disassembled with the body member in an inflated condition. Stability is imparted to the pull-toy by so arranging the body member supporting and encircling portions that the center of gravity of the body member is located intermediate and below a line passing through said last named portions.

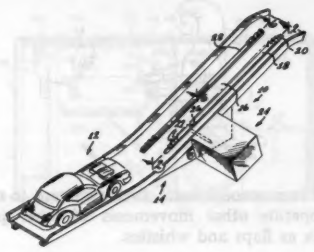
3,559,333
NOISEMAKING DEVICE
John Manzo, 1225 Cranston St., Cranston, R.I. 02920
Filed Sept. 4, 1968, Ser. No. 757,387
Int. Cl. A63h *5/00*
U.S. Cl. 46—175 5 Claims



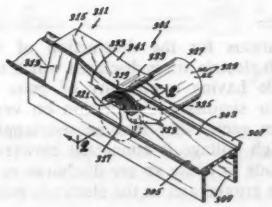
A cup device bodily movable into engagement with a bicycle wheel and having means for striking a diaphragm end of the cup to produce a noise simulating a motor sound.

3,559,334
TOY VEHICLE AND APPARATUS FOR MOVING THE VEHICLE
Janos Beny, 429 7th St., Manhattan Beach, Calif. 90266, and Marshall B. Pearlman, 233 S. Barrington Ave., Apt. 105, Los Angeles, Calif. 90049
Filed Dec. 5, 1968, Ser. No. 781,394
Int. Cl. A63h *17/00*
U.S. Cl. 46—206 2 Claims

Toy vehicle and apparatus for moving the vehicle up an inclined track area so the vehicle can thereafter coast downhill, comprising an elongated member extending along the incline with vehicle-engaging projections spaced along its length. The projections are flexible and extend with down-path directional components (pointing up the incline) so that they can push the vehicle up the incline but can move back without carrying the vehicle with it. A motor rapidly oscillates the elongated member, with its projections, in a direction parallel to the track.



3,559,335
TOY VEHICLE ACCELERATION MECHANISM
Thomas E. See, Huntington Beach, and Arthur S. Woodward, Sylmar, Calif., assignors to Mattel, Inc., Hawthorne, Calif., a corporation of Delaware
Filed May 26, 1969, Ser. No. 827,864
Int. Cl. A63h *11/00*
U.S. Cl. 46—202 11 Claims



An action toy utilizing a motor-driven rotating drum positioned to come into contact with a surface of small, unpowered vehicles moving on a roadway, opposite another surface of the vehicles which is simultaneously in contact with a stationary pressure means, so that undesired components of forces acting between the drum and the pressure means are cancelled and only the component of accelerating force in the desired direction along the roadway is allowed to act on the vehicles.

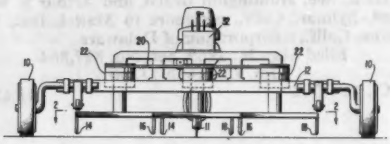
3,559,336
TOY HAVING CAPACITANCE SWITCH
Zenkichi Nozaki, Tokyo, Japan, assignor to Asahi Trading Company, Limited, Tokyo, Japan, a corporation of Japan
Filed Sept. 16, 1968, Ser. No. 762,269
Int. Cl. A63h *33/26*
U.S. Cl. 46—247 1 Claim

A self-propelled motorized toy whose movement is controlled by the distance between it and another object, such as a human operator. A transistor oscillator, resonant tank circuit, capacitive device whose capacitance is determined by the distance between it and the object connected to the resonant tank circuit, and a transistorized amplifier are connected together in such a manner that the increase or decrease in capacitance of the capacitive device causes a decrease or increase in the input signal

applied to the amplifier. The amplifier is connected to a relay switch which in a first state directs current from a power source to a motor which operates to move the

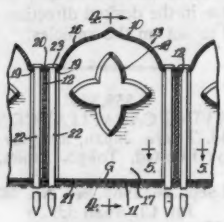
toy, and in a second state, directs current to other means which operate other movements of other parts of the toy, such as flaps and whistles.

3,559,337
APPARATUS FOR ELECTROCULTURE
Vernon F. J. Marcoux, 1617 Morgan Ave., Saskatoon, Saskatchewan, Canada, and Stanley E. Wolf, Box 116, Cutknife, Saskatchewan, Canada
Filed Feb. 18, 1969, Ser. No. 800,087
Int. Cl. A01m *21/00*
U.S. Cl. 47—1.3 **3 Claims**



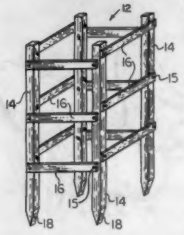
An apparatus for the destruction of vegetation by means of an electric arc is disclosed which takes the form of a vehicle having a plurality of pairs of electrodes mounted for simultaneous rotation on vertical axes so spaced from each other that an overlapping pattern is created. High voltage is connected between ground and each electrode to cause an arc discharge as the vehicle is moved over ground and as the electrode pairs are rotated.

3,559,338
DRIVEWAY EDGING
Arthur F. Klingberg, McHenry, Ill., assignor to Janier Plastic Mold Corporation, a corporation of Illinois
Filed Apr. 29, 1968, Ser. No. 725,075
Int. Cl. A01g *1/08*
U.S. Cl. 47—33 **13 Claims**



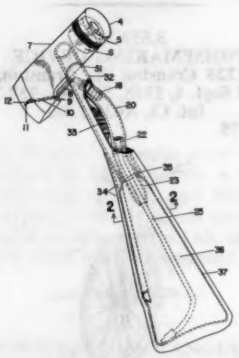
A driveway edging structure including a plurality of blocks and hinge means formed integrally with the blocks connecting the blocks to define an elongated unitary edging structure. The hinge means permits the edging structure to extend lengthwise substantially along the driveway edge which may be nonrectilinear. Stake means are associated with the edging for retaining the edging structure along the driveway edge.

3,559,339
COLLAPSIBLE PLANT STAKE ASSEMBLY
Robert W. Worley, 426 S. Clifton, Wichita, Kans. 67218
Filed Nov. 4, 1968, Ser. No. 773,264
Int. Cl. A01g *9/12*
U.S. Cl. 47—45 **3 Claims**



This invention relates to a stake assembly including a plurality of corner stakes interconnected as by lateral support or side rails so that the same may be positioned about a plant for supporting the same and readily movable into a compact, sturdy position for hanging or storing.

3,559,340
CHEMICAL AXE
Vernon A. Good, 1925 NE. Liberty St., Portland, Oreg. 97211
Filed July 11, 1968, Ser. No. 744,156
Int. Cl. B26b *23/00;* **A01g** *29/00*
U.S. Cl. 47—57.5 **3 Claims**

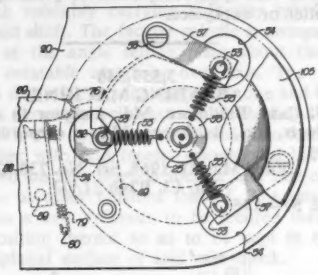


A chemical axe containing a supply of fluid and having means whereby fluid can be injected into a tree after the axe blade is imbedded into the tree.

3,559,341
ROTATABLE TURNSTILE CONSTRUCTION
William T. Alvarado, 11204 E. Rush St., El Monte, Calif. 91733
Filed Aug. 29, 1969, Ser. No. 854,087
Int. Cl. E06b *11/08*
U.S. Cl. 49—47 **11 Claims**

A rotatable turnstile construction adapted for use in supermarkets, theaters, auditoriums and the like and including a compact light weight readily assembled mounting means separable from a post and having rotatable arm means associated therewith and provided with cam means for locating and centering turnstile arms transverse to the passageway. Releasable lock means are provided to

secure each arm in passageway closing position, the lock means including a two-position latchable means, one position being locked position and the other position being a

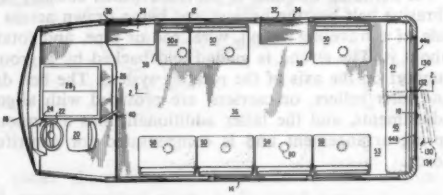


hold open position. The construction also includes a novel arrangement for cam follower biasing means which facilitates assembly of the construction.

3,559,342
DOOR AND LATCH STRUCTURE

Thomas Leroy Sherbert, Lanham, Md., and Tillison Myron Sherbert, Washington, D.C., assignors to D.C. Transit System, Inc., Washington, D.C., a corporation of the District of Columbia

Original application July 20, 1967, Ser. No. 654,865, now Patent No. 3,455,597, dated July 8, 1969. Divided and this application Apr. 4, 1969, Ser. No. 813,460
Int. Cl. E06b *3/50*
U.S. Cl. 49—143 **5 Claims**



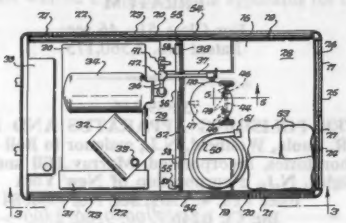
In the back wall of a bus, a door enabling large packages or other items to be brought into the bus from the rear. Slidable above the door in the rear wall of the bus, is a window panel which must be slid to one side of the door before the door can be opened. The interior paneling in the bus overlying the door is removably attached to the door, and a spring bias latch mechanism is provided for latching the door with respect to the surrounding jamb structure. The latch is actuated through a handle which, when not in use, is concealed in a compartment in the top of the door.

3,559,343
SANDBLAST TRUCK

Willard F. Foster, Alden, N.Y., assignor to C. H. Heist Corporation, Buffalo, N.Y., a corporation of New York

Continuation-in-part of application Ser. No. 658,558, Aug. 4, 1967. This application July 5, 1968, Ser. No. 748,130
Int. Cl. B24c *3/00*
U.S. Cl. 51—8 **12 Claims**

A sandblast truck including an enclosed truck body, an engine-driven compressor mounted crosswise within the truck body, a sandblast unit mounted within the truck body, a partition dividing the truck body into a first compartment for containing the compressor and a second compartment for containing the sandblast unit, the partition being removable in the event access is required to the side of the compressor, and doors in the side of the truck body for selectively permitting the compressor to be

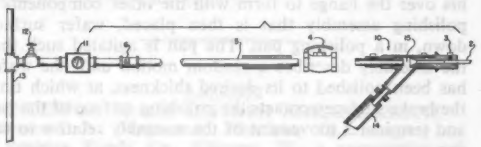


exposed to the air for cooling and air-intake purposes. In one embodiment a hopper is fixedly mounted on the floor of the second compartment for feeding a sandblast unit which extends downwardly through the floor of the truck.

3,559,344
AIR PRESSURE GUN

John A. Peterson, deceased, late of Portland, Oreg., by Ruth A. Peterson, heiress, 110 SE. 168th Ave., Portland, Oreg. 97233

Filed Jan. 25, 1968, Ser. No. 702,501
Int. Cl. B24c *1/00, 3/06*
U.S. Cl. 51—11 **2 Claims**

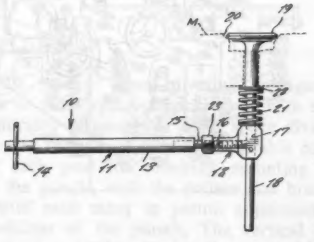


This invention relates to an air pressure gun for use in cleaning, for example, insulated generator windings with soft abrasive. The invention resides in the use of a curved nozzle whereby a layer of abrasive particles separate from the carrier air stream and impinge upon the surface to be cleaned with a wiping action rather than a conventional splattering which is inefficient and might injure the wiring or object being cleaned.

3,559,345
VALVE GRINDING TOOL

William J. Winters, 8930 Kilburn, Houston, Tex. 77016

Filed Jan. 8, 1969, Ser. No. 789,830
Int. Cl. B24b *15/02*
U.S. Cl. 51—29 **10 Claims**



A tool for grinding a valve by hand, the tool comprising a handle secured to an L-shaped head having an opening therethrough for being fitted upon the valve stem,

the head including a compression coil spring for bearing against an engine manifold while the valve head bears against the valve seat.

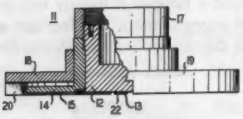
ERRATUM

For Class 51—46 see:
Patent No. 3,560,175

3,559,346
WAFER POLISHING APPARATUS AND METHOD

Carl R. Paola, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J., a corporation of New York

Filed Feb. 4, 1969, Ser. No. 796,384
Int. Cl. B24b *7/00, 9/00, 1/00*
U.S. Cl. 51—57 8 Claims

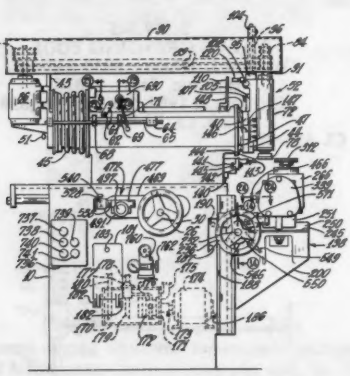


A wafer to be polished is mounted on one end of a mounting cylinder. An annular flange threaded to the mounting cylinder is adjusted such that the exposed wafer surface protrudes beyond a brake surface of the flange by a distance equal to the thickness of the wafer material to be removed. A stabilizing member slideably fits over the flange to form with the other components a polishing assembly that is then placed, wafer surface down, in a polishing pan. The pan is agitated such that the assembly describes a random motion until the wafer has been polished to its desired thickness, at which time the brake surface contacts the polishing surface of the pan and terminates movement of the assembly relative to the pan.

3,559,347
GRINDING APPARATUS

Clifford L. Garrison, Adrian, Mich., assignor to Oliver Instrument Company, Adrian, Mich., a corporation of Michigan

Filed Feb. 19, 1969, Ser. No. 800,395
Int. Cl. B24b *3/02, 7/00*
U.S. Cl. 51—98.5 14 Claims

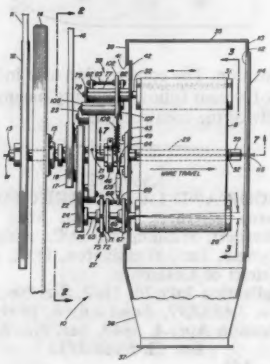


The disclosure embraces a grinding apparatus or machine especially adapted for grinding the teeth of toothed cutters or workpieces wherein the ram carrying the grinding wheel is reciprocated in a straight line, the grinding apparatus including a universally mounted workpiece or cutter support for grinding teeth of various angularities, the cutter being automatically indexed between successive grinding strokes and the grinding apparatus automatically brought to rest upon completion of grinding operations on a cutter or workpiece.

3,559,348
ABRADING MACHINE

John S. Case, Baltimore, Md., assignor to Anchor Post Products, Inc., Baltimore, Md., a corporation of New Jersey

Filed May 21, 1968, Ser. No. 730,820
Int. Cl. B24b *21/02*
U.S. Cl. 51—135 23 Claims

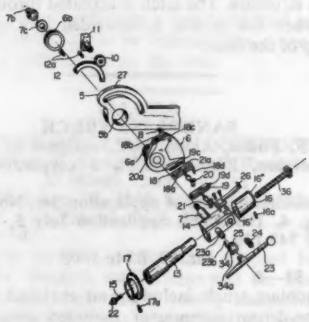


An abrading machine is provided which consists of an abrasive belt bearing against and being drawn across the side of a traveling strand, wire, rod or pipe, and rotating about it. The strand is guided and backed by a grooved support on the axis of the rotating system. The belt drive and idler rollers, or carriers, are provided with aligning adjustments, and the latter additionally has a tensioning spring arrangement and is compensated for centrifugal force.

3,559,349
FACETING MACHINE

Takahiro Imahashi, 533 Hino, Hino, Tokyo, Japan

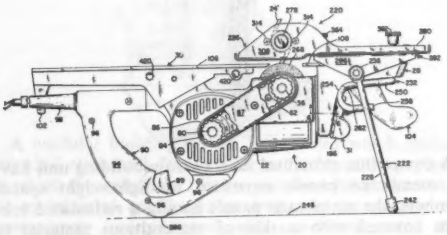
Filed Dec. 31, 1968, Ser. No. 788,160
Claims priority, application Japan, Jan. 25, 1968, 43/4,397
Int. Cl. B24b *19/00*
U.S. Cl. 51—229 7 Claims



A faceting machine according to the present invention is capable of automatically setting different cutting angles

or polishing angles of different facets. The faceting machine includes a stationary protractor, an angle setting plate rotatable on the surface of the protractor about a shaft, a fastening means to fasten the angle setting plate to said protractor at a desired angular position, and a bearing block rotatably carrying a faceter spindle and secured to said shaft. The faceter spindle is swingable on the surface of the angle setting plate about the shaft while being rotatable about its own axis. The faceter spindle has a dop stick axially secured to one end thereof for holding a gemstone being cut or polished and a cam block secured to the opposite end thereof. The cam block rotates together with said faceter spindle and has a circular cross section at a portion thereof and non-circular cross sections at other portions thereof. The angle setting plate has a cam follower to be secured thereto at a selected position thereof so as to be kept in contact with the peripheral surface of said cam block.

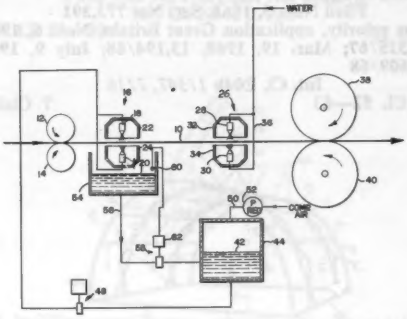
3,559,350
PLANE ATTACHMENTS
John Gordon Bentley, Liverpool, N.Y., assignor to Rockwell Manufacturing Company, Pittsburgh, Pa., a corporation of Pennsylvania
Filed May 3, 1967, Ser. No. 635,879
Int. Cl. B24b *19/00*
U.S. Cl. 51—241 **20 Claims**



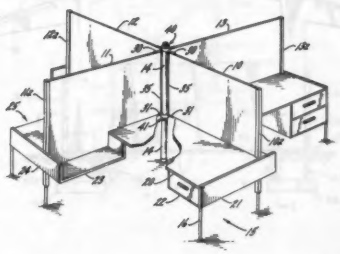
A cutter sharpening attachment for a hand-manipulated, power-operated plane is disclosed herein to comprise a grinding wheel interchangeable with the cutter element of the plane and a frame and cutter mounting arbor assembly which is adapted to be detachably mounted on the plane and which supports a bladed cutter to be sharpened for rotation and reciprocation with respect to an axis extending parallel to the rotational axis of said grinding wheel. For employing the cutter sharpening attachment, the plane is inverted and is supported in its inverted position on suitable surface by one of its handles and a pedestal which is adapted to be detachably secured to the plane. By supporting the plane in its inverted position with the pedestal, the plane may alternately be employed as a jointer by using its shoes as work-support tables and by providing a jointer fence attachment which is adapted to be detachably mounted on the plane.

3,559,351
METHOD FOR TREATING METALS
Edward S. Richter, 854 Moreland Ave. SE., Atlanta, Ga. 30316
Filed June 28, 1968, Ser. No. 740,948
Int. Cl. B24b *1/00*
U.S. Cl. 51—326 **3 Claims**

Metals are treated by directing a high pressure jet of high hardness particulate material in a fluid medium against the surface of the metal. The fluid material is comprised of small marble particles dispersed in a liquid medium such as water and in some instances including other substances, such as clay and rust inhibitors. The high pressure jets prepare the metal for plating, remove flash, markings and imperfections from the metal. The metal is then washed and buffed. The apparatus for carrying out the process includes high pressure systems for delivering the fluid mixture from nozzles at a station through which the metal is carried. A recovery system recirculates the material so that it is continuously re-used. The process and apparatus are useful for either sheet metal or individual metal parts.



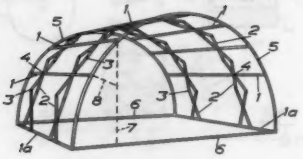
3,559,352
INTERIOR SPACE DIVIDER ARRANGEMENT
Raymond A. Magnuson, Hinsdale, Ill., assignor to Beatrice Foods Co., Chicago, Ill., a corporation of Delaware
Filed Mar. 12, 1969, Ser. No. 806,503
Int. Cl. A47b *96/12;* **E04b** *1/343*
U.S. Cl. 52—36 **7 Claims**



A versatile interior space dividing arrangement including one or more round vertical posts with each post having a plurality of panels or other space dividing elements mounted thereon. A pair of adjustable collars are fitted over each post for receiving mounting brackets secured to the panels, with the collars and brackets cooperating with each other to permit adjustment of the angular positions of the panels. The vertical positions of the panels may also be adjusted by moving the collars longitudinally along the posts. Each panel is preferably provided with a channel member secured to the edge of the panel adjacent the post and complementally formed

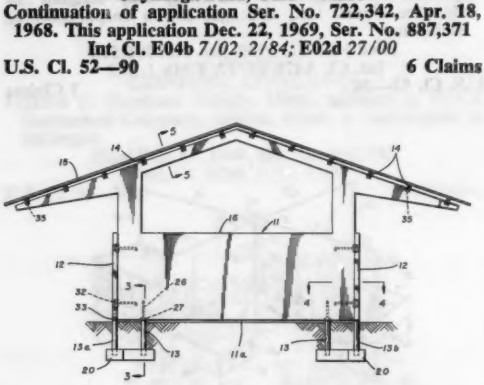
with respect to the post so that the panel may be pivoted around the post and yet the channel member blocks the view between the panels and the posts.

3,559,353
COLLAPSIBLE BUILDING STRUCTURES
Gordon Charles Partridge, Tadcaster, England, assignor to Easifold Buildings Limited, Lancaster, England, a British company
Filed Nov. 5, 1968, Ser. No. 773,391
Claims priority, application Great Britain, Nov. 6, 1967, 50,315/67; Mar. 19, 1968, 13,194/68; July 9, 1968, 32,609/68
Int. Cl. E04b *1/347, 7/16*
U.S. Cl. 52—63 **7 Claims**



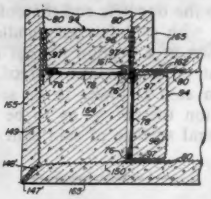
The invention comprises a collapsible building structure incorporating latticework units of pivoted together crossed links to form parallel beams or trusses joined by purlins, and which units can be extended in arched formation. The links of the units may be arranged in a horizontal or vertical plane and a flexible covering is located over the framework.

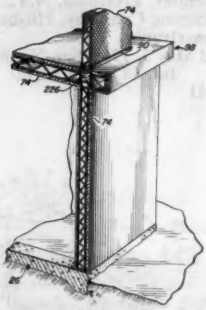
3,559,354
FREESTANDING BUILDING STRUCTURE
Thomas J. Dillon, 692 Woodbrook Road, Cuyahoga Falls, Ohio 44223
Continuation of application Ser. No. 722,342, Apr. 18, 1968. This application Dec. 22, 1969, Ser. No. 887,371
Int. Cl. E04b *7/02, 2/84;* **E02d** *27/00*
U.S. Cl. 52—90 **6 Claims**



A freestanding building having particular adaptability for low cost stable construction and being characterized by the use of a plurality of identical pre-cast concrete bent members that are supported with respect to the ground by improved type, low cost foundation components including triangularly disposed upright rods which are embedded in the ground and secured both to the bottom edges of the bent members and to the bottom edges of transverse bracing members which are, in turn, secured to vertical edges of the bent members to form a building structure with a series of stalls or compartments in a novel and unique fashion, the entire structure being covered by roof decking.

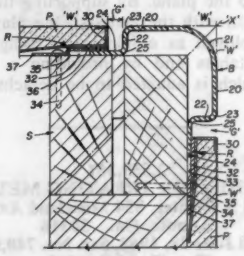
3,559,355
BUILDING CONSTRUCTION SYSTEM AND COMPONENTS THEREFOR
Paul Thorndyke Day, Jr., Baltimore, Md., assignor to Inland-Ryerson Construction Products Company, Milwaukee, Wis., a corporation of Delaware
Continuation-in-part of applications Ser. No. 367,849, May 15, 1964, and Ser. No. 421,250, Dec. 28, 1964. This application Mar. 10, 1966, Ser. No. 533,356
Int. Cl. E04b *1/20, 1/16;* **E04c** *2/42*
U.S. Cl. 52—251 **4 Claims**





A composite, structural load bearing building unit having membrane panels separated by lightweight spacer members, the membrane panels having a reticulated subform covered with a skin of cementitious material to provide a composite structure which is capable of supporting loads much greater than the capability of the lightweight spacer members. A building system with interconnected composite structural assemblies.

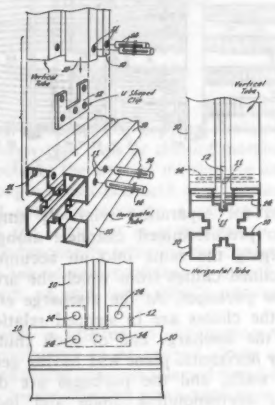
3,559,356
RESILIENT CORNER BEAD
Ephraim Koral, Denver, Colo., assignor to Construction Specialties, Inc., Cranford, N.J., a corporation of New Jersey
Filed Apr. 19, 1968, Ser. No. 722,594
Int. Cl. E04f *13/06, 19/02*
U.S. Cl. 52—254 **22 Claims**



A corner bead for external wall corners and corresponding caps for wall ends formed of a resilient, reinforced synthetic resin. The corner bead wraps about the

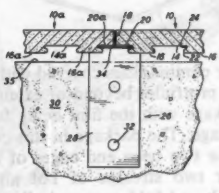
wall corner to protect the same against shocks and is carried in slot-like sockets in each wall section whereinto edge flanges of the corner bead extend to hold the same in position. In using corresponding end caps for wall-end protectors, the structure is similar, but clips are provided to hold the caps in place.

3,559,357
MODULAR BUILDING SYSTEM
David A. Lowe, 13041 Moorpark St., Studio City, Calif. 91604
Filed July 9, 1969, Ser. No. 840,299
Int. Cl. E04b *1/08, 1/48*
U.S. Cl. 52—282 **5 Claims**



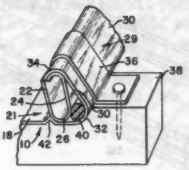
A modular building system is provided which includes extruded structural framing formed of metal or plastic, in which the individual tubular members have a rectangular multilateral configuration, and may be quickly and conveniently interconnected with one another and with other structural elements in a snap engagement or by structural pins. The resulting structure is a low cost modular building system, accommodating individual parts as removable, relocatable, replaceable, and additive, as required, for technological mass production, and easy transportation and assembly.

3,559,358
FACING WALL CONSTRUCTION
Robert Vincent Lohse, West Orange, N.J., and David George Fowler, Timmins, Ontario, Canada, assignors to Johns-Manville Corporation, New York, N.Y., a corporation of New York
Filed Sept. 15, 1967, Ser. No. 668,120
Int. Cl. E04b *1/16, 1/38*
U.S. Cl. 52—379 **2 Claims**



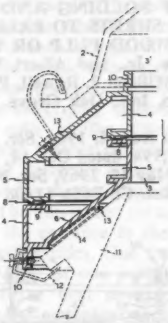
Cementitious facing panels are secured to a building wall by means of clips, each clip having one portion attached to the wall and another portion fitted in an integrally formed groove in the back of a facing panel. The panel grooves slidably mate with the clips to permit easy installation.

3,559,359
BUILDING PANEL SYSTEM
William L. Talbert, 355 Folkstone Way, York, Pa. 17402
Filed Jan. 10, 1969, Ser. No. 790,378
Int. Cl. E04d *3/363*
U.S. Cl. 52—394 **11 Claims**



A building panel system wherein adjacent panels are provided with longitudinally extending interfitting lips which are contoured in such a manner that a camming or wedging action is secured when the lips are fitted together in order to provide a highly efficient interlocked joint between the assembled panels.

3,559,360
SKYLIGHT MOUNTING ASSEMBLY OF EXTRUDED ALUMINUM SECTIONS
Pierre Emmanuel E. J. Bogaert, Chalet du Dijk 20, Wemmel, Belgium
Filed Dec. 5, 1968, Ser. No. 781,446
Claims priority, application Luxembourg, Jan. 25, 1968, 55,349
Int. Cl. E04d *13/035*
U.S. Cl. 52—656 **10 Claims**

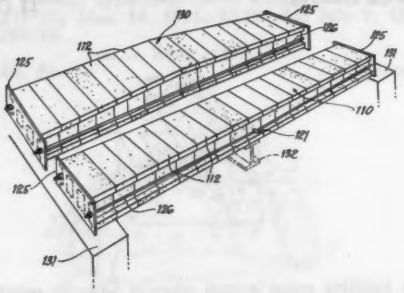


A mounting assembly for a skylight consists of a fixed rectangular frame and an identical movable frame hinged to the fixed frame. Each frame consists of four sections of the same extruded shape connected by angle fasteners at the corners in such a manner as to deflect rain water away from the opening covered by the skylight and to minimize air flow through the closed skylight. The extruded shape has two C-channel portions whose webs extend in parallel planes, and at least one plate portion obliquely inclined relative to the planes of the webs and integrally connecting respective flanges of the channel portions.

3,559,361
METHOD FOR CONSTRUCTION

George S. Sarros, Calumet City, Ill., assignor to Sarros Construction Co., Inc., Calumet City, Ill., a corporation of Illinois

Continuation-in-part of application Ser. No. 418,953, Dec. 17, 1964. This application June 4, 1968, Ser. No. 734,301
Int. Cl. E04b *1/06*; E04c *3/10*
U.S. Cl. 52—743 4 Claims

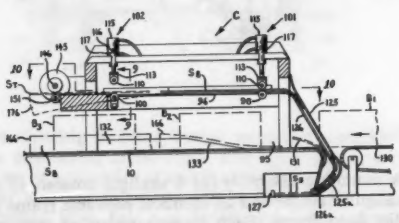


A system for producing floor constructions extending across a span between upright walls wherein construction blocks are aligned in individual rows in side-by-side relationship. A supporting structure is provided for holding individual blocks as they are placed in position to form a row. Elongated tensioning members are applied to each row while still on the support whereby the blocks in the row are subjected to compressible forces making the row self-sustaining. The support can be moved after application of tension and repeatedly used for successive rows. A grouting material is disposed in the openings defined between adjacent rows of blocks whereby the tensioning members will be embedded in the grouting material between the adjacent rows.

3,559,362
METHOD OF FOLDING AND APPLYING WRAPPER SHEETS TO BALES OF COMPRESSED WOOD PULP OR THE LIKE

Albert E. Cranston, Jr., and Albert William Cranston, Milwaukie, and William J. Rowell, Portland, Oreg., assignors to Devco, Inc., Oak Grove, Oreg., a corporation of Oregon

Original application Aug. 8, 1966, Ser. No. 570,803, now Patent No. 3,471,994, dated Oct. 14, 1969. Divided and this application May 16, 1969, Ser. No. 825,270
Int. Cl. B65b *11/06*
U.S. Cl. 53—3 1 Claim

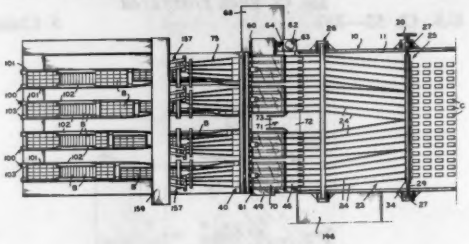


A needle bar pickup device removes wrappers from a stack and feeds them to a dispensing tray above a bundle passageway. Bottom wrappers are fed forward from the tray and disposed in curtain position across the entrance to the bundle passageway so that oncoming bundles bend the wrappers down and override them, carrying these wrappers along under the bundles. Top wrappers are fed rearward from the tray through conical creasing rollers which form downward folds in side portions of the wrappers. The creased top wrappers are then deposited on top of bundles leaving the bundle passageway.

3,559,363
ARTICLE HANDLING AND PACKAGING APPARATUS

Melbourne A. Lipp, Carmel, Calif., assignor to L. S. Heath & Sons, Inc., Robinson, Ill.

Filed May 31, 1968, Ser. No. 733,523
Int. Cl. B65b *21/06*
U.S. Cl. 53—26 27 Claims

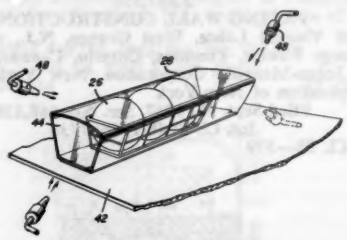


Apparatus for separating relatively small individual articles into predetermined channels along a conveyor and discharging the same into an accumulator having multiple inclined chutes from which the articles are discharged into packages. At the discharge end of the accumulator the chutes are in stepped relation with each other with the discharge end of each chute being in a substantially horizontal plane and having generally parallel bottom walls, and the packages are disposed at a substantially corresponding angle and located closely adjacent to the discharge end of the chutes so that transfer mechanism can discharge the articles directly into the packages in a high speed operation and after the packages are filled they are discharged from the machine.

3,559,364
PACKAGE WITH OPEN ENDS AND METHOD OF SEALING WRAPPER THEREON

Sebastiano J. Petrella, 11–A Golden Ave., and Salvatore J. Petrella, 18 Wright Ave., both of Medford, Mass. 02155

Filed July 25, 1968, Ser. No. 747,620
Int. Cl. B65b *53/06*
U.S. Cl. 53—33 2 Claims



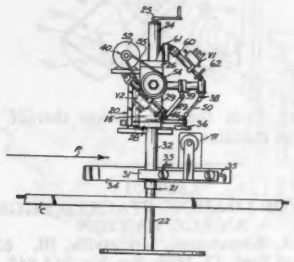
A package for commodities covered with a sheet or film of material that protrudes beyond or extends beyond both ends of the package with the film being fused at the bottom of the package. The package in this condition is conveyed so that the two open end edges of the overlapping film pass under two streams of hot air which causes the film to shrink and fold over and cling to the edges of the package thereby molding itself to the package and forming a firm and rigid seal which may either completely close each end or leave a circular-type opening therein depending on the length of the overlapping film.

3,559,365

CAPPING APPARATUS AND METHOD

Gerry G. Hull and Eugene B. Morris, Jr., Atlanta, Ga., assignors to Haskon, Inc., Warsaw, Ind., a corporation of Delaware

Filed Feb. 27, 1968, Ser. No. 708,688
Int. Cl. B65b 7/28; B67b 3/20
U.S. Cl. 53—38 10 Claims



Method and apparatus for capping containers such as bottles with screw-type caps or closure members wherein the method includes the steps of moving the containers to be capped along a prescribed path at a substantially constant selected speed, positioning a screw-type cap over the mouth of the container in a position to be screwed thereon, and subsequently screwing the cap onto the container for sealing as said container is moved along said prescribed path at said substantially constant selected speed.

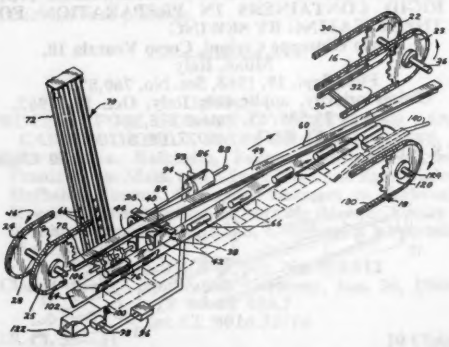
The apparatus is utilized in conjunction with means for moving containers to be capped along a prescribed path at a substantially constant selected speed and includes a first means for positioning screw-type caps for closing the containers in a position whereby the upper portion of the container will engage the cap and pivot the cap over the mouth of the container as the container is moved by said conveying means, and second means for screwing the cap onto the container to seal the open mouth of said container as the container is moved by the conveying means along its prescribed path.

3,559,366

CARTON LOADING APPARATUS AND METHOD

Jerry A. Maudlin, Pekin, Ind., and Carl K. Barnes, Lodi, Ohio, assignors to The Pillsbury Company, Minneapolis, Minn., a corporation of Delaware

Filed Nov. 29, 1968, Ser. No. 780,072
Int. Cl. B65b 5/04
U.S. Cl. 53—35 6 Claims



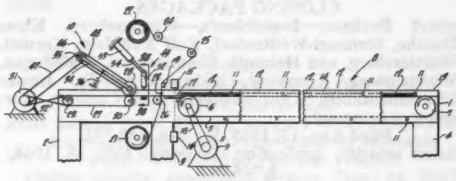
A carton loading machine consisting of two parallel conveyors mounted one above the other. Articles that are to be inserted in containers are loaded on carriers provided on the upper conveyor. Receptacles advanced by the lower conveyor are positioned in vertical alignment with the carriers on the upper conveyor. The articles in the upper carriers are supported by and slide along a fixed bar which extends the length of the apparatus between the conveyors. The carriers of the upper conveyor are mounted for lateral sliding movement. A cam on the framework forces the upper carriers laterally so that the articles upon clearing the side of the bar fall into the cartons.

3,559,367

MACHINE FOR PACKAGING NEWSPAPERS

Albert V. Misik, Los Angeles, Calif., assignor to Belco Engineering, Inc., Pasadena, Calif., a corporation of California

Continuation-in-part of application Ser. No. 649,905, June 29, 1967. This application Feb. 28, 1969, Ser. No. 826,735
Int. Cl. B65b 9/02, 57/12
U.S. Cl. 53—74 6 Claims



A horizontal, continuously moving conveyor adapted to carry newspapers individually in a flat position to an enveloping station where the newspapers are packaged in a protective film. The enveloping station has a transport mechanism that is actuated responsive to a newspaper sensor located at the conveyor. Two rolls of protective film are supported above and below the plane of the conveyor to rotate about horizontal axes so as to feed film to the enveloping station. The ends of the two rolls of film are sealed together across the entrance to the enveloping station. As each newspaper approaches the enveloping station, the sensor actuates the transport mechanism of the enveloping station, thereby moving the newspaper through the enveloping station behind the sealed ends of the two rolls of film. Consequently, the film envelops the top and bottom surfaces of the newspaper. After the newspaper passes the sensor, the transport mechanism of the enveloping station stops and a film cutter and sealer is actuated. The film is thus cut and sealed transverse to its length near the entrance to the enveloping station and is sealed along its sides. One transverse seal is utilized for the rear edge of one packaged newspaper and the front edge of the next newspaper. The transport mechanism moves the newspaper through the enveloping station at a faster horizontal speed than the continuously moving conveyor.

3,559,368

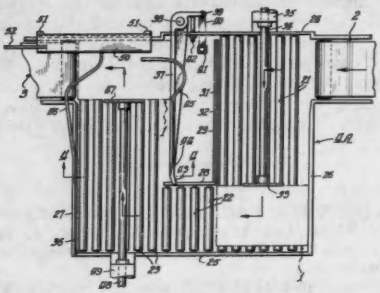
U-FLOW FLAP SLITTER

Wendell E. Standley, Lake Forest, and Lamar W. Sorensen, Des Plaines, Ill., assignors to Johns-Nigrelli-Johns, Inc., Skokie, Ill., a corporation of Illinois

Filed Nov. 12, 1968, Ser. No. 774,897
Int. Cl. B65b 11/20, 61/00
U.S. Cl. 53—167 13 Claims

A mechanism for severing the strip connections between the edges of downturned closure flaps held along the outer surfaces of the vertical walls of a paperboard case as it is advanced along a conveying means formed as a

U-shaped unit to adapt the unit to fit between aligned conveyor sections. As the case advances on the U-flow

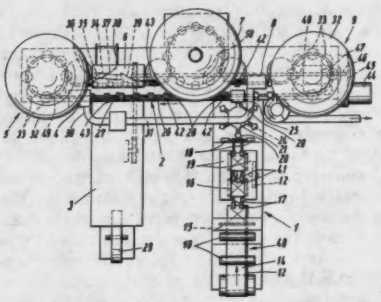


unit, the flap connections are severed and the underlying flaps are folded toward closed position.

3,559,369
MACHINE FOR PRODUCING, FILLING, AND CLOSING PACKAGES

Norbert Buchner, Beutelsbach, Wurttemberg, Klaus Domke, Stuttgart-Weilimdorf, Rolf Kohnlein, Korntal, Wurttemberg, and Helmuth Zimmermann, Waiblingen, Wurttemberg, Germany, assignors to Fr. Hesser Maschinenfabrik A.G., Stuttgart, Bad Canstatt, Germany, a company

Filed Aug. 13, 1969, Ser. No. 849,791
Claims priority, application Germany, Aug. 16, 1968, 1,786,093
Int. Cl. B65b *5/02, 43/10*
U.S. Cl. 53—183 **10 Claims**



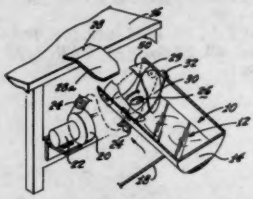
An integrated packaging machine for producing and filling sleeve shaped containers, having work stations for cutting blanks from a web of packaging material, providing a seal, forming the containers around mandrels, welding equipment for securing a cover to one end, filling the container and weld securing a cover to the other end.

3,559,370
BAG DISTENDING MACHINE

A. C. Byington, West Los Angeles, and Elmer R. Richardson, Fountain Valley, Calif., assignors to Quality Poultry Co., Inc., Culver City, Calif., a corporation of California

Filed Aug. 26, 1968, Ser. No. 755,064
Int. Cl. B65b *43/36*
U.S. Cl. 53—385 **4 Claims**

An improved bagging machine is provided in which a stack of flat cellophane or polyethylene bags, or the like, are clamped by their lip portions which are provided adjacent the open end of each bag, and in which a stream of pressurized fluid is directed across the lip portion of the uppermost bag in the stack to distend that bag so that it may easily be filled with merchandise. After it is filled, the uppermost bag may conveniently be removed from the stack by tearing it along perforations which are provided across its lip portion, for example, so as to re-

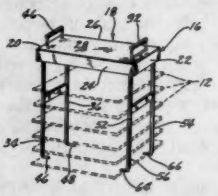


move the bag from the lip portion thereof which is clamped in the machine.

3,559,371
DEVICE FOR LOADING STACKED EGGS INTO AN EGG CARTON

Charles A. Borrowman, Griggsville, Ill. 62340

Filed Sept. 23, 1968, Ser. No. 761,545
Int. Cl. B65b *67/02*
U.S. Cl. 53—390 **3 Claims**

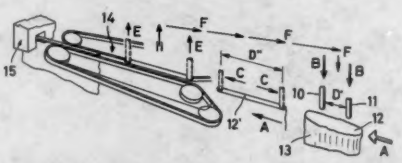


A device for loading a plurality of stacked egg flats into an egg carton including an upper frame means having four rotatable legs extending downwardly therefrom adapted to receive the egg flats therebetween. A handle means is provided on the frame means and is operatively interconnected with the legs by a linkage means to permit the handle means to rotate the legs from a first position to a second position. Each of the legs have a foot member extending transversely therefrom at the lower end thereof. The foot members are adapted to extend beneath the lowermost egg flat to support the stacked egg flats when the legs are in said first position. When the legs are rotated to said second position, the foot members are moved out of engagement with the egg flats to permit the frame means and the legs to be raised with respect to the egg flats.

3,559,372
APPARATUS FOR GRIPPING AND STRETCHING THE MOUTH OF SACKS AND SIMILAR NON-RIGID CONTAINERS IN PREPARATION FOR THEIR SEALING BY SEWING

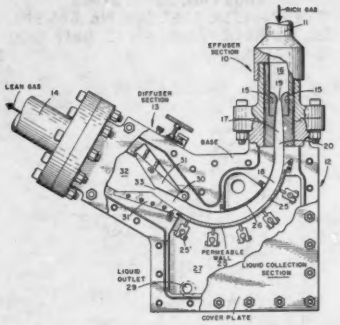
Renzo Giuseppe Cerioni, Corso Venezia 10, Milan, Italy

Filed Sept. 19, 1968, Ser. No. 760,878
Claims priority, application Italy, Oct. 13, 1967, 21,589/67, Patent 815,384
Int. Cl. B65b *65/00, 7/06, 61/00*
U.S. Cl. 53—393 **10 Claims**



Apparatus for ripping the mouth of sacks and other nonrigid containers in order to stretch and flatten it, in preparation for a sealing operation.

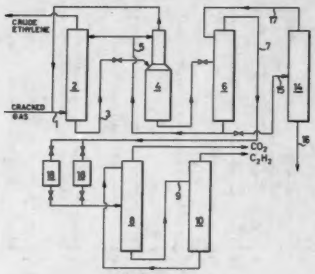
3,559,373
SUPERSONIC FLOW SEPARATOR
Robert L. Garrett, Houston, Tex., assignor to Esso Production Research Company, a corporation of Delaware
Filed May 20, 1968, Ser. No. 730,371
Int. Cl. B01d *53/00*
U.S. Cl. 55—9 49 Claims



Method and apparatus for separating one or more components from a multicomponent, high-pressure gas stream The gas stream is expanded to supersonic velocity through a supersonic effuser to achieve low temperatures and low pressures in the supersonic gas stream and cause condensed liquid particles (drops) and/or solid particles to form. The supersonic gas stream is made to traverse a planar bend provided with a permeable outer wall to and through which liquid and/or solid particles are inertially moved and thereby separated from the gas stream. The separated particles are collected along with the dissolved and entrained gases which also separate from the gas stream. The supersonic gas stream is then decelerated to subsonic flow through a supersonic diffuser and part of the pressure of the gas stream is recovered. Means are provided to move the final shock wave to a stable position which is an optimum position for practical operation when a supersonic flow is started through the supersonic flow separator. To achieve such movement of the final shock wave, the throat area and contour of the diffuser is made adjustable so that the throat area and size of the diffuser channel are initially enlarged to move the final shock wave through the diffuser throat to start supersonic flow in the separator and thereafter reduced to locate the final shock wave near the diffuser throat to operate the separator efficiently at maximum back pressure.

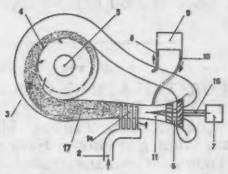
3,559,374
PROCESS FOR ISOLATING ACETYLENE AND CARBON DIOXIDE FROM CRACKED GASES
Walter Krause, Kelkheim, Taunus, Hartmut Schilken, Frankfurt am Main, and Günter Heck and Egon Malow, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany, a corporation of Germany
Filed Jan. 21, 1969, Ser. No. 792,612
Claims priority, application Germany, Jan. 30, 1968, P 16 68 086.7
Int. Cl. B01d *53/14*
U.S. Cl. 55—31 10 Claims

A process is described for the isolation of carbon dioxide and acetylene from a cracked gas by multistage washings using acetone and dimethylformamide, wherein the cracked gas is first washed with acetone, then acetylene, carbon dioxide and ethylene are expelled from the



acetone solution by release from pressure and the acetylene is washed out of this mixture with dimethylformamide.

3,559,375
METHOD OF AND APPARATUS FOR COMPRESSING GAS
René Bidard, Paris, France, assignor to Compagnie Electro-Mecanique, Paris, France, a body corporate
Filed Nov. 15, 1968, Ser. No. 776,169
Claims priority, application France, Nov. 24, 1967, 129,586
Int. Cl. B01d *19/00*
U.S. Cl. 55—45 12 Claims

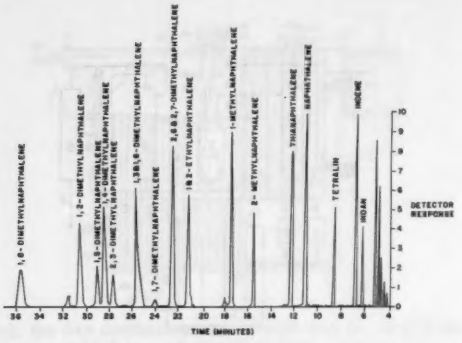


An arrangement for compressing gases of relatively low molecular weight consists in creating a gas-liquid emulsion from the gas, the emulsion being formed by injection of the gas into a liquid which has previously been brought up to speed; the emulsion is then slowed down in a diffuser thereby undergoing compression, and the two phases—gas and liquid—are then separated. The compressed gas is then passed to its point of utilization and the liquid is then put through a pump where it regains the energy which it had given up to the gas and is then re-cycled with fresh gas to be emulsified and compressed.

3,559,376
NAPHTHALENE ANALYSIS METHOD
Edward M. Emery, Brentwood, and Gerald M. Gasser, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware
Continuation-in-part of application Ser. No. 616,277, Feb. 15, 1967. This application Nov. 7, 1969, Ser. No. 870,585
Int. Cl. B01d *15/08*
U.S. Cl. 55—67 9 Claims

Method for analysis of mixtures containing naphthal-

ene and alkyl-substituted naphthalene isomers by gas-liquid chromatography using certain polyphenyl thio-



ethers, polyphenyl ether-thioethers or phenylmercapto-biphenyl compounds as absorbents.

3,559,377
PROCESS FOR SEPARATING CARBON BLACK FROM GASEOUS MIXTURES

Giovanni Perri, Giuseppe Tubiello, and Gaetano Palombella, Novara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

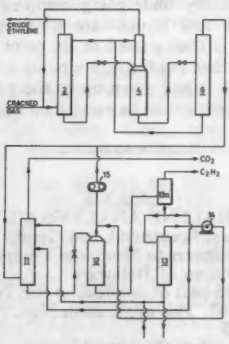
No Drawing. Filed Apr. 22, 1965, Ser. No. 450,201
Claims priority, application Italy, Apr. 29, 1964, 9,289/64
Int. Cl. B01d *47/06*
U.S. Cl. 55—85 2 Claims

A process for separating carbon black from gaseous mixtures by contacting the gaseous mixture with an emulsion of oily hydrocarbon and water at a temperature below the dew point of water. The aqueous suspension of oil and carbon black is settled and additional oil is added to the carbon black and oil floating layer to make it fluid and pumpable.

3,559,378
PROCESS FOR ISOLATING CARBON DIOXIDE AND ACETYLENE FROM CRACKED GASES

Walter Krause, Kelkheim, Taunus, Hartmut Schilken, Frankfurt am Main, and Günter Heck and Egon Malow, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany, a corporation of Germany

Filed Jan. 12, 1970, Ser. No. 2,033
Claims priority, application Germany, Jan. 16, 1969, P 19 01 963.7
Int. Cl. B01d *19/00*
U.S. Cl. 55—64 1 Claim

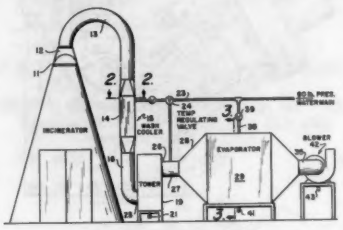


Improvement in the process for isolating carbon dioxide and acetylene from cracked gases which substantially contain hydrogen, carbon monoxide, methane, carbon dioxide, ethylene and acetylene, by multistage washings using acetone and dimethylformamide as solvents.

3,559,379
AIR WASHER VIA ARTIFICIALLY PRODUCED ATMOSPHERE AND RAIN CONDITIONS

Robert Lambert, Rte. 4, Box 321, Annapolis, Md. 21401

Filed Nov. 29, 1967, Ser. No. 686,519
Int. Cl. B01d *47/06, 47/12;* B01f *3/09*
U.S. Cl. 55—223 3 Claims



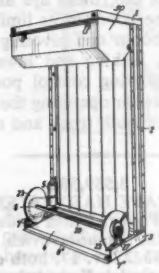
A self cleaning air cleaner and cooler consisting of a sheet metal enclosure with a series of moistened burlap covered screens to produce an artificial atmosphere whereby air drawn through the artificial atmosphere is cooled and scrubbed. A first gas feed duct contains a stream of solids laden gas. Spray nozzles discharge liquid within the first gas feed duct for quenching and cooling the solids-laden gas and thereby entrapping solids in the liquid. A tower communicates with the first gas feed duct for collecting and disposing of solids entrapped in the liquid. A second gas feed duct communicates with the tower and has sensing and control valve communicating with the spray nozzles for regulating the temperature of the solids-laden gas. An evaporator has a chamber communicating with the second gas feed duct and having a plurality of filter members and a liquid source for supporting and wetting a first filter member. The filter members are positioned in upright position across the chamber and creates an artificial atmosphere for washing and scrubbing the solids-laden gas. A blower communicates with the chamber for force-fully drawing solids-laden gas through the apparatus and discharging the resulting quenched and scrubbed gas into the atmosphere. The chamber further comprises an enclosure having an inlet end communicating with the second gas feed duct and an outlet end communicating with the blower. The enclosure has top, bottom, and side walls. The liquid source further comprises a plurality of liquid spray nozzles for supplying a liquid in a volume exceeding the amount which will be evaporated. The liquid source is suspended diagonally across the top wall of the enclosure. A plurality of filter members each comprising a material capable of being saturated by a liquid and a sheet of open mesh material forming a rigid backing contiguous thereto. The liquid source supports the first filter member of the plurality of filter members and provides a liquid to saturate the first filter member. Second and third filter members of the plurality of filter members are disposed in an upright diagonal position within the enclosure position within the enclosure and is supported by the top wall. The second and third filter members are fastened firmly to the bottom and side walls of the enclosure. The filter members are arranged within the enclosure to include air passages between the filter members whereby the solids-laden air drawn through the filter members is quenched and scrubbed by an artificial atmosphere in the chamber.

3,559,380

ROLLER BAND AIR FILTER ASSEMBLY

Gerhard Max Neumann, Berlin-Dahlem, Germany, assignor to Delbag Luftfilter GmbH, Berlin, Germany

Filed Nov. 13, 1968, Ser. No. 775,290
Claims priority, application Germany, Nov. 22, 1967, D 37,009
Int. Cl. B01d *46/18*
U.S. Cl. 55—354 6 Claims



In automatic roller band filter assemblies for filtering air, the filter band passes from one bobbin in an upper portion of the assembly through an intermediate sealed filter portion to a driven bobbin in a lower portion of the assembly, the said driven bobbin being driven by a motor associated with the said lower portion.

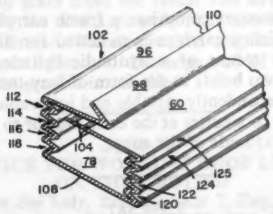
It is often desirable to provide a plurality of assemblies side-by-side as near to each other as possible, and the invention provides an arrangement of motor and gear train on a frame member of the said lower portion whereby an adjacent band filter assembly may be positioned with maximum economy of space, and moreover which allows a plurality of band filter assemblies when arranged side-by-side to be driven by a single motor associated with one of the band filter assemblies.

3,559,381

VACUUM CLEANER FILTER BAG

John J. Fesco, Baldwin, N.Y., assignor to Studley Paper Company, Inc., Far Rockaway, N.Y., a corporation of New York

Filed Oct. 31, 1968, Ser. No. 772,344
Int. Cl. B01d *46/02*
U.S. Cl. 55—357 4 Claims



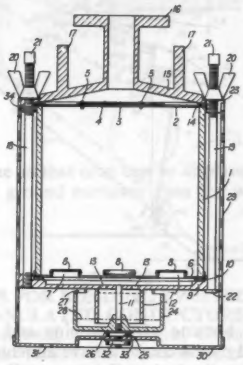
A vacuum cleaner filter bag formed of a blank sheet of material folded to define a front wall, a rear wall and opposing accordion folded side walls, said bag being closed at both ends and access means being provided into the interior of said bag in said front wall, said rear wall being provided with a convenient hand grip for causing expansion of the bag.

3,559,382

DESICCANT BREATHER FOR ELECTRICAL TRANSFORMERS, REACTORS AND ASSOCIATED EQUIPMENT

Peter Charles Jaggard, Wraysburg, Buckinghamshire, and Graham George Hooper, Ashford, Middlesex, England, assignors to W. R. Grace & Co.

Filed Apr. 10, 1968, Ser. No. 720,157
Claims priority, application Great Britain, Apr. 19, 1967, 18,082/67
Int. Cl. B01d *53/04*
U.S. Cl. 55—274 3 Claims



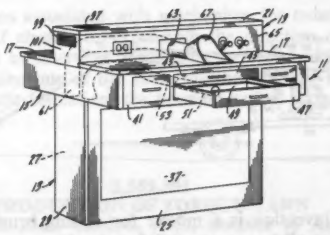
An apparatus for drying gases passing into or out of an otherwise closed chamber. Said apparatus comprises a transparent container for desiccant, a means to control the admission of atmospheric air into the desiccant container, and a releasable means for easily removing the desiccant from its container.

3,559,383

BENCH STRUCTURE WITH BUILT-IN DUST COLLECTOR

James M. McCabe, Chicago, Ill., assignor to Coe Laboratories, Inc., Chicago, Ill., a corporation of Illinois

Filed Mar. 3, 1969, Ser. No. 803,563
Int. Cl. B01d *46/02*
U.S. Cl. 55—472 1 Claim



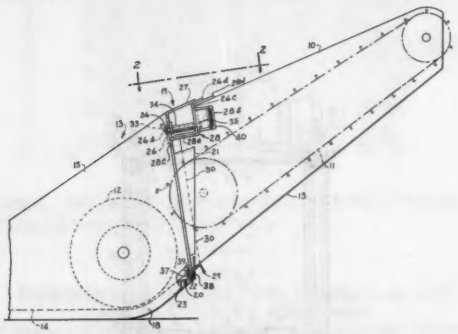
A laboratory bench assembly including a bench table mounted on a pedestal and having a dust-collector mechanism located in the pedestal with the ducts leading to the dust collector concealed in the bench table. A dust-collecting hood may be located in a drawer of said bench table and provided with a telescoping slip joint to permit the drawer to be opened and closed.

3,559,384

ATTACHING MEANS FOR MOUNTING A HEADER ON THE FEEDER HOUSING OF A COMBINE

Richard P. Bernhardt, Leola, and Ronald T. Sheehan, Lancaster, Pa., assignors to Sperry Rand Corporation, New Holland, Pa., a corporation of Delaware

Filed June 5, 1969, Ser. No. 830,666
Int. Cl. H01d *41/06*
U.S. Cl. 56—20 9 Claims



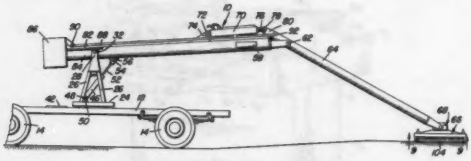
The feeder housing of a combine and the harvesting header carried by the combine have attaching means comprising a generally L-shaped beam at the top front of the feeder housing and a U-shaped beam at the bottom front. Brackets are transversely spaced on the upper beam and receive the upper header beam for lifting and holding the header. The lower beam of the header engages the U-shaped beam on the feeder housing. The header has angulated plates projecting towards the feeder housing and engaging the ends of the L-shaped beam to align the feeder housing with the header. Bolts extend through the upper beams and the lower beams and have nuts for fastening the header to the feeder housing.

3,559,385

SLOPEMOWER APPARATUS FOR HIGHWAY AND RAILROAD RIGHTS-OF-WAY

Jay S. Eaton, % Dixie Asphalt Co., P.O. Box 15195, West Palm Beach, Fla. 33406

Filed July 12, 1968, Ser. No. 744,562
Int. Cl. A01d *35/26*
U.S. Cl. 56—25.4 11 Claims



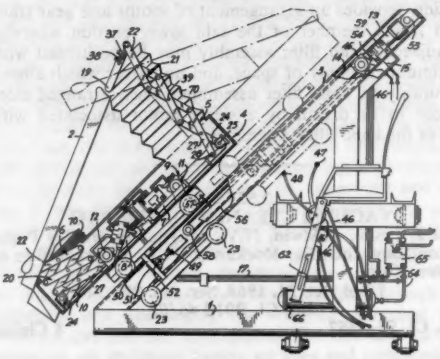
This invention is a mower for cutting brush, bushes, shrubs, small trees, etc., and for mowing grass on either side or slope of a railroad trackway or the median strip or sides of a motor highway. It includes a small, preferably four wheel powered automobile truck that can travel on either a railroad track or a highway, with a cab offset to one side of the truck and both mower and truck controls in the offset cab for simultaneous or separate operation by a single operator. The operator may operate in either direction, a seat being provided on both forward and rearward sides of the controls. A boom is rotatably mounted for limited rotation on the truck chassis, on a position midway between all four wheels thereof, and an arm pivoted on the boom carries a mower universally mounted on its end, for positioning between a rearward position and a side position on the cab side of the truck, the other end of the boom moving between a position alongside the cab to a position over the opposite side of the truck vehicle, and this end has a counterweight movable on a trackway on the boom end, the counterweight being linked to the mower arm. In addition to the truck controls in the offset cab, there are also hydraulic controls for operating the boom in its limited swinging position, for lifting the boom and pivoting the arm thereon, and provides lifting, locking and lowering controls for each of them, and floating control position for at least one of them as well as for operating the mower. Only one operator is needed for both truck and mower controls.

3,559,386

GRAPE HARVESTER

Vladimir Ivanovich Popov, Ulitsa Budennovskaya 203/2, kv. 9; and Cheslav Stanislavovich Tolochko, Ulitsa Budennovskaya 203/2, kv. 17, both of Novocherkassk; and Nikolai Grigorievich Kurgansky, Novocherkasskoe shosse 28, kv. 2; Vintsiant Yakovlevich Prokopenko, Novocherkasskoe shosse 34, kv. 22; and Ivan Gerasimovich Babenko, Novocherkasskoe shosse 15, kv. 6, all of Rostov-on-Don, U.S.S.R.

Filed Oct. 12, 1967, Ser. No. 674,938
Int. Cl. A01g *19/00*
U.S. Cl. 56—331 4 Claims



A grape harvester comprises a frame carrying inclined guides on which a carriage is mounted for displacement therealong by means of a hydraulic cylinder. The carriage carries two hoists in the form of lazy tongs linkages which are independently raisable and lowerable and hoists are connected to a cutter at the ends thereof to modify the elevation and attitude of the cutter.

3,559,387

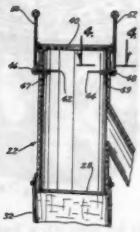
FRUIT PICKING APPARATUS

Robert R. Myers, Boca Raton, Fla., assignor to Elliott Brothers (London) Limited, London, England, a company of Great Britain

Filed Dec. 2, 1968, Ser. No. 780,353
Int. Cl. A01g *19/08*
U.S. Cl. 56—334 3 Claims

A fruit picking apparatus comprising, a vacuum pump having a vacuum line extending therefrom and having a hollow cannister secured to the end thereof. The hollow

cannister is in vacuum communication with the vacuum pump and has a fruit chute operatively connected to the lower end thereof which extends to a fruit receptacle. A flexible diaphragm extends across the upper end of the cannister and has a central opening formed therein which has a diameter less than the diameter of the fruit being picked. A pair of levers are pivotally secured to the cannister below the flexible diaphragm and are pivotally activated upon the passage of fruit through the diaphragm. The pair of levers have stem engaging portions extending upwardly therefrom which are pivotally moved into engagement with the fruit stem on the fruit passing through the central opening of the diaphragm and coming into engagement with the pair of levers.

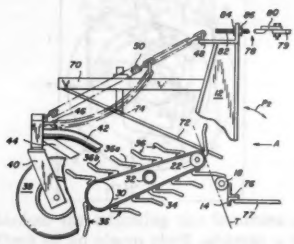


3,559,388

BELT-TYPE GRAIN PICK-UP

Reynold John Renn, Calgary, Alberta, Canada, assignor to Renn-Cupit Industries Ltd., Calgary, Alberta, Canada

Filed May 10, 1968, Ser. No. 728,131
Int. Cl. A01d *87/02*
U.S. Cl. 56—350 14 Claims



An endless conveyor belt type grain pick-up provided with flexible pick-up tynes and a driven stripper roller for removing grain from the tynes. The stripper roller is located below the discharge end of the conveyor and kept a constant distance therefrom. The angular relationship of the stripper roller and discharge end of the conveyor relative to the ground is variable.

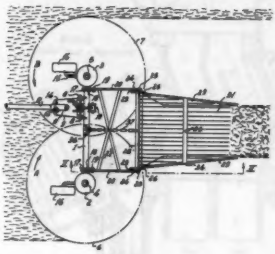
3,559,389

DEVICE FOR WORKING CROP LYING ON THE GROUND

Cornelis van der Lely, Bruschenrain 7, Zug, Switzerland, Ary van der Lely, Weverskade 10, Maasland, Netherlands; and Cornelis Johannes Gerardus Bom, Esdoornlaan 36, Rozenburg, Netherlands

Filed Aug. 31, 1966, Ser. No. 576,279
Claims priority, application Netherlands, Sept. 15, 1965, 6511984, 6511985; Sept. 22, 1965, 6512295; Oct. 13, 1965, 6513220
Int. Cl. A01d *79/00*
U.S. Cl. 56—370 24 Claims

A device and method for working crop lying on the ground, the device including a plurality of rake members mounted on a frame to rotate in either direction to work and displace crop. A guide is located to the rear of the rake members and the guide is pivoted to move vertically relative to the frame so that crop can be displaced and guided onto a strip of ground narrower than the working width of the vehicle.

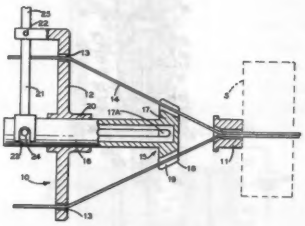


3,559,390

APPARATUS FOR BONDING TWISTED PLASTIC INSULATED CONDUCTORS

Harry H. Staschewski, Langenhagen, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany, a corporation of Germany

Filed Oct. 22, 1968, Ser. No. 769,553
Claims priority, application Germany, Oct. 24, 1967, P 17 04 154.2
Int. Cl. H01b *13/02*
U.S. Cl. 57—6 6 Claims



Apparatus associated with mechanism for twisting the elements of electric cable wherein the direction of twist is reversed at intervals; the apparatus being adapted to bond the elements of the cable together by way of their thermoplastic insulation, the bonding action taking place at intervals.

3,559,391

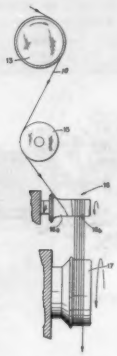
PRODUCTION OF TORQUE YARN

Charles M. Rice, Candler, N.C., assignor to American Enka Corporation, Enka, N.C., a corporation of Delaware

Filed June 28, 1968, Ser. No. 740,869
Int. Cl. D01h *7/92*; D02g *1/02, 1/08*
U.S. Cl. 57—34 9 Claims

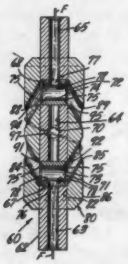
A treating system is disclosed for creating torque in running lengths of continuous filament or spun yarn. In a preferred embodiment, the yarn is elongated simultaneously with the torque producing operation. The treating system utilizes a conical yarn-driven idler roller which

serves at least three functions, e.g., separates convolutions of yarn, derives energy from a motor-driven roller, and



twists yarn passing over the conical portion to produce torque. The torque may be set by any desired means.

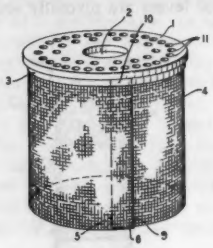
3,559,392
FALSE-TWIST SPINDLE
Henri Crouzet, 15 Rue Cuvier, Roanne, Loire, France
Filed May 7, 1968, Ser. No. 727,215
Int. Cl. D01h *7/92;* **D02g** *1/06*
U.S. Cl. 57—77.3 **9 Claims**



A system for twisting a yarn by a tubular member adapted to be rotated about its longitudinal axis, the tubular member having at least one longitudinal bore through which the yarn is fed while it is twisted, the tubular member also having a pair of lateral passageways which communicate with the longitudinal bore and which are disposed symmetrically about the longitudinal axis.

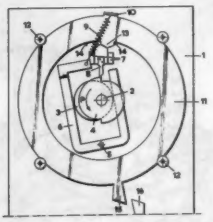
3,559,393
COLLECTING VESSEL AND TOP FOR SPINNING YARN CAKES
Howard Arthur Seeber, Martinsville, N.J., assignor to Johns-Manville Corporation, New York, N.Y., a corporation of New York
Filed May 21, 1969, Ser. No. 826,626
Int. Cl. D01h *7/78, 7/82, 1/08*
U.S. Cl. 57—76 **9 Claims**

In a preferred embodiment, for use in a cylindrical container revolving around its axis for the collection of a yarn annulus or cake, a plastic annular disk, as a top to the container, having fused to one face thereof a cylinder of screen material formed by forming a cylinder from a strip of the screen material with one end of the strip overlapping the other end, the width of the strip, i.e., the height of the screen cylinder, being slightly less



than the depth of the container, and the plastic annular disk having a plurality of perforations therein for the passing of water during the process of forming the yarn cake within the revolving screen.

3,559,394
CALENDAR CLOCKWORK
Pieter Wilhelmus Maria Gaemers, Javastraat 273A, The Hague, Netherlands
Filed Oct. 31, 1969, Ser. No. 872,961
Claims priority, application Netherlands, Oct. 31, 1968, 6815559
Int. Cl. G04b *19/24*
U.S. Cl. 58—4 **2 Claims**

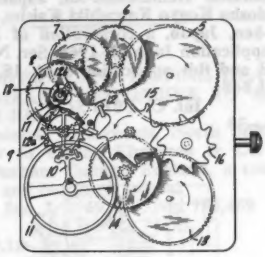


A calendar clockwork is safeguarded against faulty operation and constructed to make it possible for the calendar mechanism to be manually adjusted independently of the operation of the clockwork mechanism.

3,559,395
DIGITAL TIMEPIECE
Tadahiro Kikuchi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan
Filed Dec. 19, 1967, Ser. No. 691,800
Claims priority, application Japan, Dec. 21, 1966, 41/83,436; Jan. 18, 1967, 42/3,102; Mar. 22, 1967, 42/23,382; Mar. 29, 1967, 42/25,496
Int. Cl. G04b *15/00*
U.S. Cl. 58—7 **12 Claims**

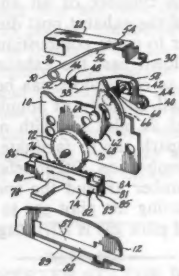
A timekeeper with digital recording or time indication in which "jumping" time indication is carried out as to hours, tens-of-minutes, and minutes by compact and simplified mechanism comprising two complete barrels with arbors each driving a respective going gear train with respective escapements and the escapement of one of the gear trains being under control of the other gear train.

Common winding and time setting mechanism winds the mainsprings of both barrels with arbors. The indicating



is operatively associated with one of the escapements and has "jumping" disks for indicating time in hours, tens-of-minutes, and minutes visually.

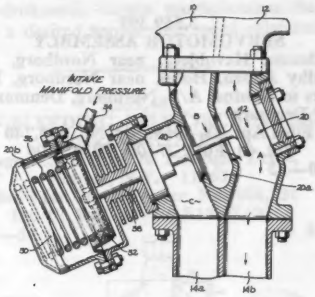
3,559,396
VARIABLE LOUDNESS ALARM MECHANISM
William C. Wingler, Stow, Mass., assignor to General Electric Company, a corporation of New York
Filed Feb. 28, 1969, Ser. No. 803,355
Int. Cl. G04b *23/10*
U.S. Cl. 58—21.12 **4 Claims**



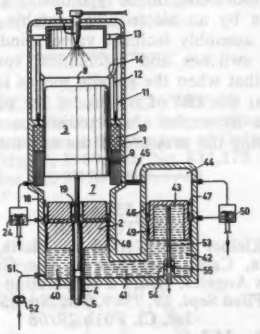
A mechanism for adjusting the loudness of an alarm from the front of an alarm clock wherein a slider having a rack integrally formed thereon is located between a front mounting plate and a front wall of the clock casing. An actuating lever integrally formed with the slider extends through the front wall of the casing so that the volume of the alarm may be adjusted by simply sliding the actuating lever back and forth across the front wall of the clock.

3,559,397
TURBO SUPERCHARGER CONTROL MECHANISM
Bernard J. Navarro, 720 Geneva St., Glendale, Calif. 91206
Filed Mar. 21, 1969, Ser. No. 809,327
Int. Cl. F02b *37/08*
U.S. Cl. 60—13 **5 Claims**

An automatic control mechanism is provided which permits a turbo supercharger to be functional at low engine speeds without sacrificing efficiency at the higher engine speeds. The control mechanism of the invention also serves to remove the inherent rotational lag of the turbo supercharger when the engine is suddenly called upon to produce a high power output. The mechanism of the invention involves a diverter valve which is operated, for example, by intake manifold pressure, and which diverts exhaust gases through a single flow channel at low engine speeds and through two separate flow channels at the higher engine speeds.



3,559,398
HOT-GAS PISTON ENGINE
Roelf Jan Meijer and Henricus Cornelis Johannes van Beukering, Emmasingel, Eindhoven, Netherlands, assignors, by mesne assignments, to U.S. Philips Corporation, New York, N.Y., a corporation of Delaware
Filed May 6, 1968, Ser. No. 726,667
Claims priority, application Netherlands, May 10, 1967, 6706508
Int. Cl. F03g *7/06*
U.S. Cl. 60—24 **16 Claims**



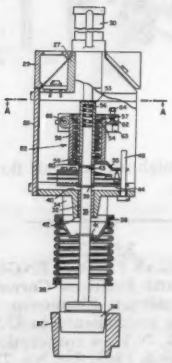
A hot gas piston engine has within its cylinder-housing (i) a working space containing a compressible medium adjacent a working surface of the piston, (ii) a buffer space containing an incompressible fluid adjacent the opposite second surface of the piston, and (iii) an annular space between the cylinder and piston containing an incompressible fluid. Secured between the cylinder and piston is a rolling diaphragm seal, its two sides respectively in communication with the working space and medium therein and the annular space and fluid therein, to seal one space from the other. A regulating device maintains a substantially constant pressure difference across the seal. The product of the fluid pressure in the buffer space and the area of the piston's second surface is substantially equal to the product of the working medium's mean

pressure and the area of the piston's working surface, whereby fluid forces acting on the piston from the working and buffer spaces are substantially neutralized.

3,559,399
SERVOMOTOR ASSEMBLY

Ingolf Johnsen, Havnbjerg, near Nordborg, and Jens Gammelby Jensen, Holm, near Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark, a company of Denmark

Filed Apr. 28, 1969, Ser. No. 819,740
Int. Cl. F01k *27/00*; F03g *7/00*
U.S. Cl. 60—23 **10 Claims**

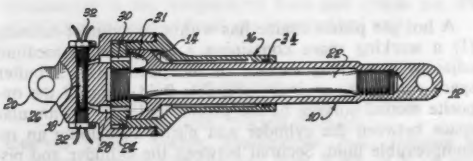


The invention relates to a servomotor assembly with the servomotor being of the type having a piston which is displaceable by an electrically heatable expansion material. The assembly includes valve spindle means along with limit switches and mechanical spring means arranged so that when the spindle means is stopped by an abutment at the end of its stroke, the piston is allowed to continue its stroke a short distance further without unduly raising the pressure of the expansion material.

3,559,400
ACTUATOR

Erich J. Kleiner and Gerald A. Pierik, Palos Verdes Peninsula, Calif., assignors to The Garrett Corporation, Los Angeles, Calif., a corporation of California

Filed Sept. 19, 1969, Ser. No. 859,376
Int. Cl. F01b *29/08*
U.S. Cl. 60—26.1 **12 Claims**

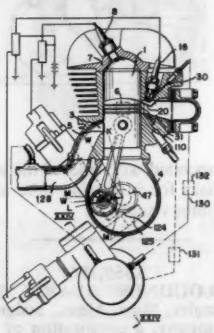


An actuator to either shorten or lengthen the distance between the two load connections. The actuator includes a tension member which is permanently deformed by actuation of the actuator and includes means to limit the magnitude of deformation upon activation.

3,559,401
EXHAUST GAS CLEANING DEVICE FOR INTERNAL COMBUSTION ENGINES

Satoru Takahashi, Hamamatsu-shi, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Hamana-gun, Shizuoka-ken, Japan, a corporation of Japan

Original application June 12, 1968, Ser. No. 736,391. Divided and this application Sept. 15, 1969, Ser. No. 871,045
Int. Cl. F01n *3/14*
U.S. Cl. 60—30 **9 Claims**

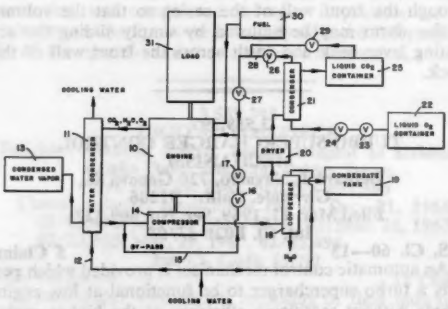


A spark plug is caused to spark at a point in the exhaust passageway immediately downstream from the exhaust port of each cylinder of an engine immediately after full closure of the exhaust port during the compression stroke in order to cause combustion of some fuel-air gas unavoidably blown past the exhaust port in the exhaust passageway as charge-loss gas before full closure of the port. A small quantity of supplementary fuel-air gas can be supplied as pilot gas with or without supplemental air to the spark gap to facilitate and ensure positive ignition and combustion. Other refinements include a precombustion chamber around the spark gap and control devices for causing the pilot gas to be supplied only when this supply of pilot gas is advantageous.

3,559,402
CLOSED CYCLE DIESEL ENGINE

W. James Stone and James P. Diebold, China Lake, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Apr. 24, 1969, Ser. No. 819,076
Int. Cl. F02n *25/06, 25/10*
U.S. Cl. 60—31 **2 Claims**



A completely closed-cycle heat engine system for underwater application comprising a conventional heat engine and a system to condense the exhaust gases, including a water vapor condenser suitably connected to a com-

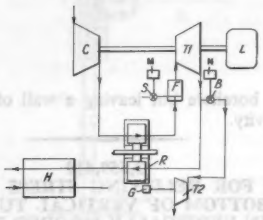
pressor means and a heat exchanger, a dryer, a carbon dioxide condenser and tanks for storing liquid carbon dioxide and water.

3,559,403

THERMAL POWER PLANT HAVING HEAT FLOW CONTROL MEANS RESPONSIVE TO AMBIENT TEMPERATURE

Waldemar Hryniszak, Cullercoats, North Shields, England, assignor to Clarke Chapman & Co. Limited, Gateshead, Durham County, England, a company of Great Britain and Northern Ireland

Filed Jan. 2, 1969, Ser. No. 788,459
Int. Cl. F02c 7/10
U.S. Cl. 60—39.15 5 Claims



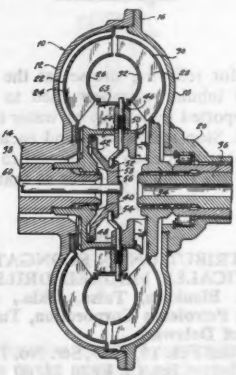
The specification describes a thermal power plant in which combustion products form the working fluid in a turbine working stage and are then directed through a rotary regenerator to preheat combustion air. The speed of the regenerator is regulated by temperature-sensitive means to vary the rate of heat transfer between the turbine exhaust flow and the incoming combustion air flow so that the heat flow to the working stage can be controlled thereby in dependence upon changes in ambient temperature. The supply of fuel may also be subject to temperature control so that it is varied together with the degree of preheat.

3,559,404

TORQUE CONVERTER STATOR BLADE PITCH CONTROL CIRCUIT

Richard D. Moan, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

Filed Apr. 15, 1969, Ser. No. 816,287
Int. Cl. F16d 33/04
U.S. Cl. 60—54 4 Claims



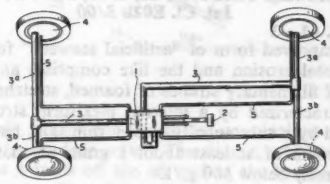
A hydrokinetic torque converter transmission for a single rotor gas turbine engine, the torque converter comprising a bladed impeller, a bladed stator and a bladed turbine, the stator being held fast against rotation, a servo for adjusting the angularity of the blades of the stator with respect to the converter fluid flow vectors and valve means for actuating the servo to produce an infinitely-variable, hydrokinetic, torque multiplication that tends to maintain a desired torque and speed relationship for the engine.

3,559,405

SELF-BLEEDING, SELF-CIRCULATING BRAKING SYSTEM

Roger L. Neilson, 70 Trafalgar Drive, Shirley, N.Y. 11967

Filed Mar. 20, 1969, Ser. No. 808,731
Int. Cl. B60t 11/10; F15b 7/00
U.S. Cl. 60—54.5 8 Claims



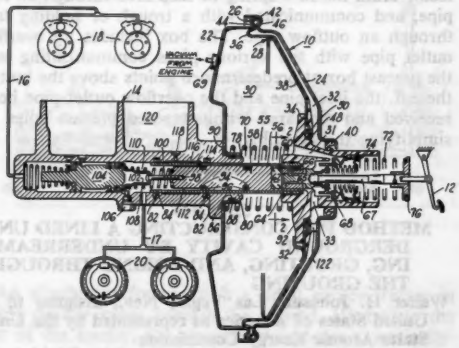
The present invention provides for hydraulic braking systems, which generally include a master cylinder and a plurality of conduits which extend from the master cylinder to hydraulically operable braking mechanisms and a return line communicating with the conduits at each braking mechanism for return flow back to the master cylinder. The return lines are of a lesser diameter than the conduits and preferably include an adjustable valve arrangement at the master cylinder inlet for each such line which allows a continual flow path, adjustable as to rate, between each line and the master cylinder.

3,559,406

VEHICLE BRAKING SYSTEM

Delbert J. Gardner, South Bend, Ind., assignor to The Bendix Corporation, a corporation of Delaware

Filed May 2, 1969, Ser. No. 821,175
Int. Cl. F15b 7/00, 7/08
U.S. Cl. 60—54.5 6 Claims



A pressure ratio changing device for a servomotor of a power braking system. A first piston secured to the hub member of the movable wall of the servomotor extends into the hydraulic chamber of a master cylinder. A second piston located in a bore within the first piston also extends into the hydraulic chamber. Depression of

an actuator by an operator will open a valve in the hub member to create a pressure differential across the movable wall. As the wall moves, the first piston will energize the master cylinder to pressurize the hydraulic fluid in the braking system. Further depression of the actuator by the operator will move the second piston to add to the energizing force of the first piston. A reaction member adjacent the second piston will selectively position the movable wall and the actuator in proportion to an internal reactive back force to maintain equilibrium within the system during activation.

3,559,407

ARTIFICIAL SEAWEED

Gerrit Schuur, Delft, Netherlands, assignor to Shell Oil Company, New York, N.Y., a corporation of Delaware

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,757
Int. Cl. E02b *3/00*
U.S. Cl. 61—3 **3 Claims**

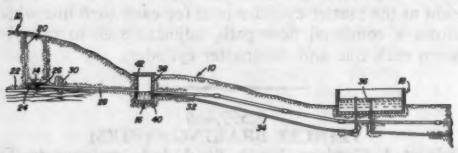
An improved form of "artificial seaweed" for combating coastal erosion and the like comprises an anchored array of filamentary strands of foamed, stretched polyolefin, characterized by a internal plexiform structure surrounded by a substantially closed, thin skin, having a tensile strength of at least about 1 gram per denier and a final density below 500 g./l.

3,559,408

SPRING DEVELOPMENT SYSTEM

La Mar M. Earnhart, Box 45, Waynesville, Ohio 45068

Filed Sept. 26, 1968, Ser. No. 762,764
Int. Cl. E02b *11/00, 7/08*
U.S. Cl. 61—10 **10 Claims**



The system contemplates the provision of a precast water collection box or reservoir communicated with collector drain tile in a spring or seep area through an inlet pipe, and communicated with a trough or holding tank through an outflow pipe. The box includes an overflow outlet pipe with the various pipes communicating with the precast box at predetermined points above the bottom thereof, the inlet pipe and the overflow outlet pipe being received and mortared within tapered precast holes for simplifying the assembly.

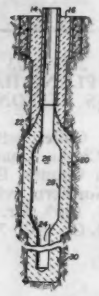
3,559,409

METHOD FOR CONSTRUCTING A LINED UNDERGROUND CAVITY BY UNDERREAMING, GROUTING, AND BORING THROUGH THE GROUTING

Walter H. Johnson, Las Vegas, Nev., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed June 24, 1969, Ser. No. 836,087
Int. Cl. E21d *5/00*
U.S. Cl. 61—41 **5 Claims**

Drilling a borehole, locating a casing in the borehole, filling the space between the casing and the borehole with grout, underreaming a large borehole beneath the grout, underreaming the large borehole, filling the lare underreamed borehole with additional grout that binds with the previously underreamed grout, drilling a small borehole from the casing into the added grout, and underreaming



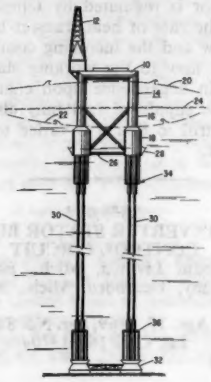
the small borehole but leaving a wall of grout to form a lined cavity.

3,559,410

SYSTEM FOR RELIEVING STRESS AT THE TOP AND BOTTOM OF VERTICAL TUBULAR MEMBERS IN VERTICALLY MOORED PLATFORMS

Kenneth A. Blenkarn and David A. Dixon, Tulsa, Okla., assignors to Pan American Petroleum Corporation, Tulsa, Okla., a corporation of Delaware

Filed July 30, 1968, Ser. No. 748,867
Int. Cl. B63b *35/44, 21/00*
U.S. Cl. 61—46.5 **12 Claims**



Structure for relieving stresses at the top and bottom of elongated tubular members used to connect floating structure supported by a body of water to anchors on the floor thereof. Stop means surround each such connecting tubular member near each end thereof to limit the angular deflection of the tubular member at that point.

3,559,411

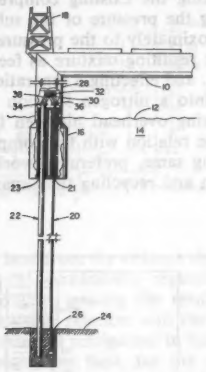
LOAD DISTRIBUTION IN ELONGATED MEMBERS OF VERTICALLY MOORED DRILLING VESSEL

Kenneth A. Blenkarn, Tulsa, Okla., assignor to Pan American Petroleum Corporation, Tulsa, Okla., a corporation of Delaware

Filed Feb. 10, 1969, Ser. No. 797,861
Int. Cl. E02d *21/00*
U.S. Cl. 61—46.5 **7 Claims**

This invention relates to a system for mooring a floating structure to the ocean floor. Special buoyancy chambers support this structure, including a work deck above the body of water. The structure is connected to anchors

in the floor of the body of water by elongated members such as cables and pipes having different elongations per unit of stress. Because of wave action, the floating platform is subject to vertical heave forces. Because of such increased tension, the cable and pipe risers are both elongated but with the cable undergoing the most elongation. Hence, the influence of vertical heave forces is felt almost entirely by the pipe and not by the cable. In accordance



with this invention a load distribution means is provided to connect both the cable and the riser pipe to the floating structure. In a preferred embodiment the upper end of the riser pipe and the upper end of the cable are connected to opposite ends of a flexible member which goes over a pulley which is supported from a superstructure. The cable and pulley system proportions the total tension between the pipe and the cable according to a desired ratio.

3,559,412

METHOD OF FORMING ENLARGED BASE ENCASED CONCRETE PILES

Frank M. Fuller, Washington Township, Bergen County, N.J., assignor to Raymond International, Inc., New York, N.Y., a corporation of New Jersey

Filed July 15, 1968, Ser. No. 744,846
Int. Cl. E02d *5/44*
U.S. Cl. 61—53.6 **12 Claims**

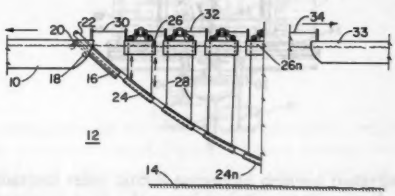
A method of forming enlarged base piles by forming a cylindrical hole in the ground, and thereafter placing a charge of bulk material such as zero slump concrete in the bottom of the hole, and then placing a pile shell with a closed tip over the mandrel and driving it into the hole and into the charge of material, and thereafter withdrawing the mandrel and filling the shell with concrete.

3,559,413

ADJUSTABLE STINGER FOR USE IN LAYING PIPELINE IN WATER COVERED AREAS

Daniel Silverman, Tulsa, Okla., assignor to Pan American Petroleum Corporation, Tulsa, Okla., a corporation of Delaware

Filed Feb. 7, 1968, Ser. No. 703,680
Int. Cl. F16l *1/00*
U.S. Cl. 61—72.3 **9 Claims**



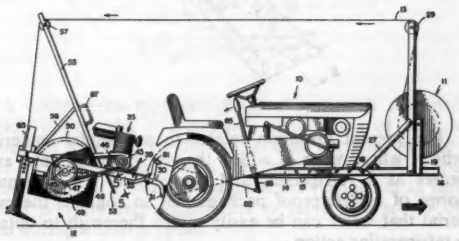
A flexible stinger for use in laying pipelines from a floating barge in deep water. The stinger, which supports the pipe as it trails off the aft end of the barge, is composed of a plurality of trough or pipe-support sections. The trough sections are linked together by flexible or pivotal means. A float for each such trough section is positioned on the surface directly above the sections. Lines run from winches on the float to each end of each trough section. The floats are sufficiently large to support the trough sections and any pipe laid therein. Thus, by adjusting the length of the lines supporting the troughs, the stinger, composed of such trough sections, can be made to take any selected shape or contour.

3,559,414

APPARATUS AND METHOD FOR LAYING FLEXIBLE CABLE

Fred W. Pike, 14 Garden Ave., and Darrell E. Armstrong, 105 Huber St., both of Pontiac, Ill. 61764

Filed Feb. 6, 1967, Ser. No. 614,336
Int. Cl. E02f *5/02, 5/18*
U.S. Cl. 61—72.6 **3 Claims**



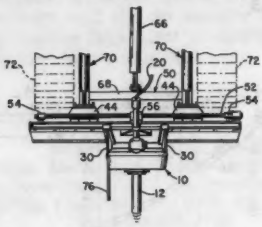
An attachment for use with a small garden tractor in laying flexible cable beneath the ground. Hitched to the rear of the tractor, the attachment includes a vertically-adjustable plow shoe for forming a tunnel or channel for the cable, a power-driven rotary blade or slicer in front of the plow shank for opening a narrow slit in the ground to a depth less than the depth of the shoe, and a cable guide for feeding cable into the tunnel behind the plow shoe. The plow shoe and the rotating blade cooperate with the tractor hitching mechanism to provide a tunnel having uniform depth beneath the surface of the ground.

3,559,415

EARTH CUTTING APPARATUS

Donald R. Vaughan and Carl J. Falcon, Woodland, Calif., assignors, by mesne assignments, to Donald R. Vaughan, Woodland, Calif.

Filed Nov. 3, 1967, Ser. No. 680,487
Int. Cl. F16l 1/00; A01b 33/06
U.S. Cl. 61—72.6 13 Claims



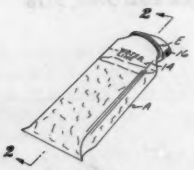
Earth cutting apparatus having a cutter tool comprised of a rotatable shaft provided with a number of spaced cutter bits secured to and extending laterally from the shaft. A support mounts the shaft for axial rotation and is shiftably mounted on a guide bar attached to a forwardly moving vehicle. The guide bar extends transversely of the forward direction of travel of the vehicle and has means to move the support longitudinally of the guide bar in either direction to selectively position the cutter tool along a path transverse to said forward direction of travel. A depth control is provided to assure that the cutter tool will be maintained at a predetermined depth below ground level.

3,559,416

WATER ENERGIZED REFRIGERANT AND PACKAGE THEREFOR

Thomas E. Cornwall, Buena Park, Calif., assignor, by mesne assignments, to Technology Investors, Inc., Los Angeles, Calif., a small business investment corporation

Filed Apr. 21, 1967, Ser. No. 632,775
Int. Cl. F25d 5/00
U.S. Cl. 62—4 10 Claims



The present invention relates to a granular material which, when water is added thereto, becomes cold and serves as a refrigerant, and a preferred and alternate forms of a waterproof package that so contains the material that water can be easily mixed therewith to obtain a refrigerating action.

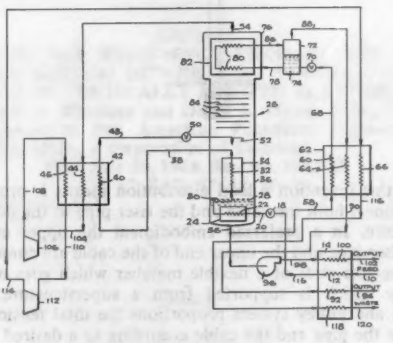
3,559,417

SEPARATION OF LOW BOILING HYDROCARBONS AND NITROGEN BY FRACTIONATION WITH PRODUCT STREAM HEAT EXCHANGE

Michael L. Hoffman, Beverly Hills, Calif., assignor, by mesne assignments, to McDonnell Douglas Corporation, Santa Monica, Calif., a corporation of Maryland

Filed Oct. 12, 1967, Ser. No. 674,984
Int. Cl. F25j 3/02
U.S. Cl. 62—24 15 Claims

System for the separation of gases, particularly of mixtures of a low boiling hydrocarbon and nitrogen, e.g., a mixture of methane and nitrogen, which involved providing a mixture of such low boiling hydrocarbon and nitrogen at relatively high pressure, e.g., about 1,000 p.s.i., cooling the compressed gas mixture to a temperature close to its saturation temperature, passing the cooled compressed mixture in heat exchange relation with the lower portion of a fractionating column operating at a pressure substantially lower than the pressure of the compressed gas mixture, and providing reboil heat to the column, subcooling the existing compressed feed gas mixture, reducing the pressure of the subcooled compressed mixture approximately to the pressure in the column, introducing the resulting mixture as feed into the fractionating column, and effecting a separation of the mixture in the column into a nitrogen fraction and a hydrocarbon fraction, passing overhead nitrogen from the column in heat exchange relation with the compressed feed mixture for subcooling same, preferably work expanding the exiting nitrogen and recycling the expanded nitrogen again



in heat exchange relation with the compressed feed mixture, work expanding the exiting nitrogen and further cooling same, withdrawing low boiling hydrocarbon in substantially pure liquid form from the lower portion of the column, passing a portion of such liquid hydrocarbon in heat exchange relation with the work expanded nitrogen for subcooling such hydrocarbon, throttling the subcooled portion of liquid hydrocarbon and further reducing the temperature and pressure thereof, employing the throttled hydrocarbon to provide condensing duty in the upper portion of the column, passing the resulting exiting vaporized hydrocarbon and the main portion of the liquid hydrocarbon withdrawn from the column in heat exchange relation with the compressed feed mixture for cooling same, compressing the hydrocarbon product to desired pressure, and passing nitrogen withdrawn from heat exchange relation with liquid hydrocarbon, into heat exchange relation with the compressed gas mixture for cooling same.

3,559,418

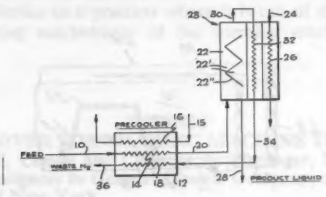
LIQUEFACTION OF NATURAL GAS CONTAINING NITROGEN BY RECTIFICATION UTILIZING INTERNAL AND EXTERNAL REFRIGERATION

Michael L. Hoffman, Los Angeles, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif., a corporation of Maryland

Filed Aug. 7, 1968, Ser. No. 750,996
Int. Cl. F25j 3/02
U.S. Cl. 62—24 15 Claims

Liquefaction of natural gas containing nitrogen, the remainder consisting essentially of low boiling hydrocarbon such as methane, at low power requirements, by separating the major portion of the nitrogen in such gas during liquefaction, comprising cooling the natural gas to

a saturated vapor, introducing the cooled saturated natural gas into a rectification column, separating the natural gas in the column into a nitrogen overhead and a liquid natural gas enriched in the low boiling hydrocarbon, e.g., methane, passing the overhead nitrogen in heat exchange relation along the column and passing an external refrigerant in heat exchange relation along the column, for removal of heat from the column throughout its length and effecting a nonadiabatic separation of the natural gas in the column, passing the resulting heated nitrogen into heat exchange relation with the natural gas feed and passing an external refrigerant in heat exchange relation with the natural gas feed, for the above-noted cooling of such natural gas feed to a saturated vapor.



3,559,419

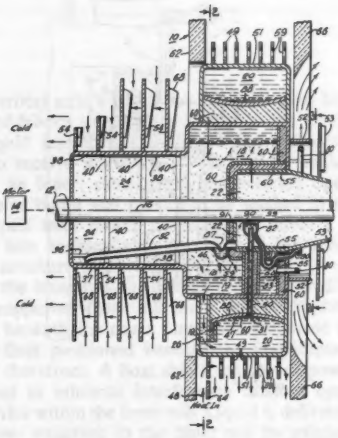
CENTRIFUGAL ABSORBTIVE THERMODYNAMIC APPARATUS AND METHOD

Frederick W. Kantor, 523 W. 112th St., New York, N.Y. 10025

Continuation-in-part of application Ser. No. 608,321, Jan. 10, 1967. This application July 18, 1969, Ser. No. 843,167

Int. Cl. F25b *15/04, 3/00*

U.S. Cl. 62—101 **13 Claims**



Ammonia and water are rotated in a rotary enclosure. Ammonia gas is driven out of the water. Differential action of the centrifugal force on the liquid and the gas is used to transport the gas and water without use of a mechanical pump. The gas and the water are pumped through the rotor together, with the gas flow aiding in pumping the liquid.

3,559,420

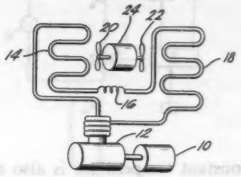
DELAYED RESTARTING CIRCUIT FOR COMPRESSOR MOTOR

Dennis J. Lipscomb, La Grange, Ind., assignor to Motor Wheel Corporation, Lansing, Mich., a corporation of Ohio

Filed Mar. 5, 1969, Ser. No. 804,514

Int. Cl. F25b *1/00*

U.S. Cl. 62—158 **5 Claims**



A thermal relay circuit providing delayed restarting of a compressor motor in a refrigeration system each time the power to the motor is interrupted by either a line fault, a thermostat or a manual shut-off switch. The thermal relay is connected in the circuit so that its contacts energize a main relay whose contacts, in turn, energize the motor. The heater of the thermal relay is connected directly across the contacts of the main relay so that when the main relay contacts operate they simultaneously energize the motor and short the resistance heater to de-energize the thermal relay.

3,559,421

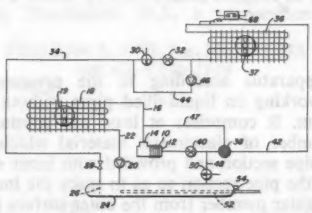
REFRIGERATION DEFROST SYSTEM WITH RECEIVER HEAT SOURCE

Otto J. Nussbaum, Monroeville, Pa., assignor to Halstead & Mitchell Co., Zelienople, Pa., a corporation of Pennsylvania

Filed Feb. 7, 1969, Ser. No. 797,392

Int. Cl. F25b *41/00*

U.S. Cl. 62—196 **7 Claims**



A compression-type refrigeration system is disclosed which utilizes the conventional suction line of such a system as a defrost conduit at periodic intervals and further includes means to heat the liquid refrigerant in the receiver of the system to maintain the refrigerant at sufficient pressure and temperature to serve as a source of heat during a defrost cycle.

3,559,422

MEANS FOR REGULATING THE TEMPERATURE OF REFRIGERATORS

Walter Holzer, Meersburg (Bodensee), Germany, assignor to Holzer Patent AG, Zug, Switzerland

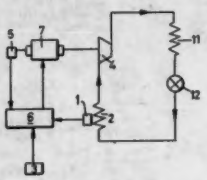
Original application Oct. 25, 1967, Ser. No. 678,010. Divided and this application Dec. 9, 1968, Ser. No. 782,134

Int. Cl. F25b *41/00*

U.S. Cl. 62—209 **8 Claims**

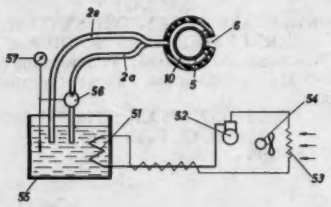
This invention relates to a system for regulating the temperature of refrigerating equipment and has for one of its objectives frost control. This is achieved because

the cold output is here regulated by an electronic analogue value control according to a variable temperature setting, a continuously measured actual temperature and a measurement value which is an analogue of the amount of cold



produced. Constant temperature is also maintained when the refrigerator door is opened by automatically shifting the response value of temperature control to a temperature value that is substantially lower than normal operation.

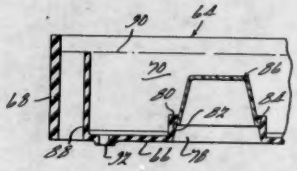
3,559,423
EQUIPMENT FOR WORKING ON LIQUID-FILLED CONDUITS
Werner Scheidler, Gundershausen, Germany (24 Canerouth Drive, Etobicoke, Ontario, Canada)
Filed Aug. 8, 1969, Ser. No. 848,556
Int. Cl. F25d *3/00*
U.S. Cl. 62—293 **16 Claims**



The apparatus according to the present invention permits working on liquid-filled pipes without having to drain them. It comprises at least one substantially annular member of elastomeric material which is placed about a pipe section and provided with inner sealing lips engaging the pipe section so as to space the inner surface of the annular member from the outer surface of the pipe section and define between them a sealed substantially annular clearance. A refrigerating unit is provided, and a refrigerant cooled by the refrigerating unit is circulated through this annular clearance to thereby freeze the liquid in the pipe section and to form in the latter an ice plug which prevents circulation of liquid through the pipe and enables work on the pipe downwstream of the ice plug without requiring draining of the liquid.

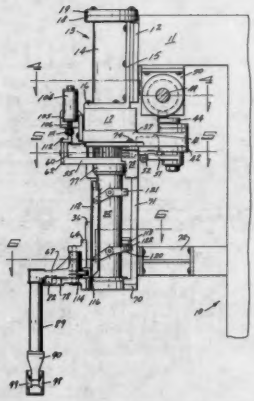
3,559,424
ICEMAKING APPARATUS
Marcus L. Nelson, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Ann Arbor, Mich., a corporation of Delaware
Original application Sept. 12, 1967, Ser. No. 667,117, now Patent No. 3,465,537, dated Sept. 9, 1969. Divided and this application Apr. 1, 1969, Ser. No. 812,103
Int. Cl. F25c *1/04*
U.S. Cl. 62—347 **8 Claims**

An icemaking apparatus comprising an inverted ice forming mold; a refrigeration system including an evaporator and a condenser comprising a tank containing thawing water in heat transfer relation with the hot gaseous refrigerant line of the refrigeration system; a thawing water retaining compartment adjacent the mold and adapted to contain water in heat transfer relation with respect to the evaporator; a water reservoir disposed below the form; spraying means for directing water within the reservoir toward the form; a water inlet and a water outlet and fluid circuit means communicating the inlet with the tank and the outlet with the reservoir; a



pump for pumping water from the reservior to the fluid spraying means and a motor for driving the pump; the above system being adapted to use a quantity of water as a cooling medium for the condenser during the freezing cycle, wherein such water is heated a predetermined amount, thereafter using that heated water to release the ice from the ice form, and finally use the same water to make-up the ice during the next successive freezing cycle.

3,559,425
GLASSWARE TAKEOUT APPARATUS
George W. Irwin, Holland, and Urban P. Trudeau, Toledo, Ohio, assignors to Owens-Illinois, Inc., a corporation of Ohio
Filed May 20, 1968, Ser. No. 730,441
Int. Cl. C03b *9/40*
U.S. Cl. 65—260 **9 Claims**



Glassware such as glass containers which are blown or expanded within blow molds are normally oriented in rows on a ware conveyor passing alongside of but spaced from the row of molds. When the ware is produced in tandem, conventionally the orientation of the ware in the molds is at right angles with respect to the direction of movement of the conveyor. A ware takeout apparatus operates to lift the ware from the location of the blow molds by gripping the necks of the ware and moving the

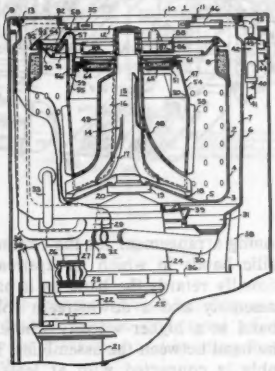
ware bodily through an arc of 90° so that the ware is positioned over a moving conveyor. The ware is then lowered to a certain degree until it is positioned a short distance over the conveyor, at which time the mechanism holding the ware is opened so as to release the ware. Operation of the takeout mechanism is timed with the operation of the forming machine and a fail-safe arrangement is provided so that in the event the take-out apparatus is operating improperly, an operator may, by operating a single control valve, effectuate the movement of the takeout device to a position where it is out of the way of the moving mechanisms of the forming machine.

3,559,426

COVER FOR WASHING MACHINE TUB

Robert E. Condit and Clarence A. Zinninger, Louisville, Ky., assignors to General Electric Company, a corporation of New York

Filed Mar. 19, 1969, Ser. No. 808,558
Int. Cl. D06f *39/08, 31/00*
U.S. Cl. 68—4 **6 Claims**



A vertical axis washing machine, adapted to wash two loads of fabrics simultaneously in separate solutions without liquid interchange therebetween, includes an outer tube to receive liquid and fabrics to be washed in that liquid, an inner, substantially imperforate open top tub to receive liquid and fabrics to be washed in that liquid, and liquid inlet means positioned to direct a stream of liquid into registry with the top of the inner tub. A cover structure is provided for substantially closing the top of the inner tub, the cover structure including a cover plate supported from the inner tub, a diaphragm positioned beneath the cover plate and supported therefrom, and a float positioned beneath the diaphragm and supported therefrom. A float shield may be disposed beneath the float to minimze interference to float operation by the fabrics within the inner tub. Liquid is delivered through the cover structure to the inner tub by passing through inlet openings in the cover structure, traveling radially inwardly along the upper surface of the diaphragm, and discharging through an outlet opening in the diaphragm. Disposed between the inlet and outlet openings is a continuous bead depending from the lower surface of the cover plate. When the liquid rises in the inner tub to a predetermined level, a buoyant force is exerted on the float which in turn causes the diaphragm to seat with the bead thereby terminating the delivery of liquid to the inner tub.

3,559,427

CLOTHES STEAMING DEVICE

Norman J. Baker, 4701 N. 68th St., Apt. 142, Scottsdale, Ariz. 85251

Filed Mar. 19, 1969, Ser. No. 808,616
Int. Cl. D06c *1/00*
U.S. Cl. 68—222 **8 Claims**

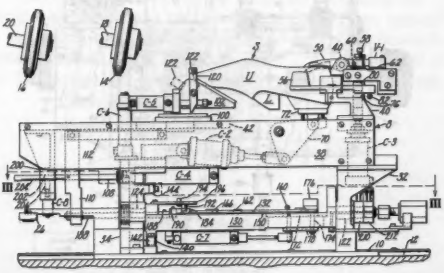
A clothes steaming device comprising a housing having an upstanding member adapted to support clothing thereon; a boiler in said housing having a flexible steam outlet and applicator for applying steam to clothing; a water supply tank in said housing communicating with said boiler and hydrostatic liquid level control means communicating with said water supply tank in said boiler to maintain a low volume low liquid level in said tank for rapid production of steam, and whereby steam may be produced very quickly, as desired.

3,559,428

SHOE BOTTOM ROUGHING MACHINES

Edward S. Babson, Ipswich, Mass., assignor to USM Corporation, Flemington, N.J., a corporation of New Jersey

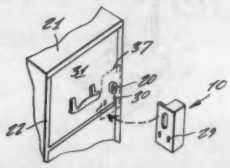
Filed June 2, 1969, Ser. No. 831,821
Int. Cl. C14b *1/44*
U.S. Cl. 69—6.5 **18 Claims**



A machine for roughing the bottoms of shoes having a pair of roughing tools and a support for a shoe during relative movement between the tools and the support to cause the shoe to pass by the tools and a template for positioning the tools in which the template is automatically adjusted in both lengthwise and widthwise directions to accommodate shoes of different sizes and is automatically reversed by rotation about its longitudinal axis, to accommodate right or left shoes in accordance with the size

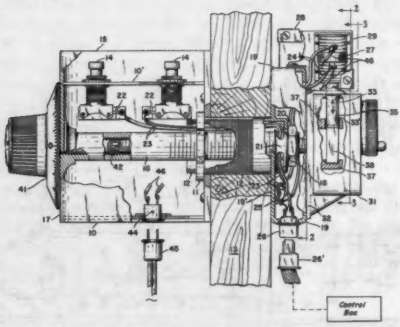
and character of the shoe on the support. The shoe support also embodies an abutment for determining the heightwise position of the toe end of each shoe placed thereon and a heel support movable in response to the engagement of the heel end of a shoe therewith for actuating control means to initiate an automatic operating cycle of the machine.

3,559,429
DUAL CONTROL CONVERSION LOCKING MECHANISM
Robert Hermann, P.O. Box 114, Stronghurst, Ill. 61480
Filed Jan. 31, 1969, Ser. No. 795,606
Int. Cl. E05b *65/46, 67/38*
U.S. Cl. 70—85 **4 Claims**



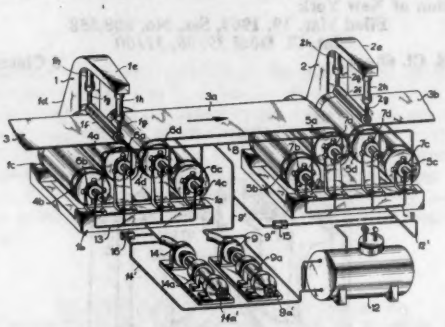
A locking mechanism for a file cabinet or the like, the device comprising a plurality of individual lock units, each one of which prevents access for gaining reach to a second lock without first opening up a first lock positioned in front of the other.

3,559,430
LOCKING MECHANISM
Russell S. Waller, 5508 Beaman Place, Hillcrest Heights, Md. 20031
Continuation-in-part of application Ser. No. 502,748, Oct. 22, 1965. This application Aug. 8, 1968, Ser. No. 756,718
Int. Cl. E05b *47/00*
U.S. Cl. 70—277 **8 Claims**



A security lock construction which includes both a dial operated mechanical combination lock similar to the conventional type having plural, peripherally gated tumbler wheels, a reciprocative bolt, and a dial operated driver wheel for rotating the tumbler wheels and for activating a fence lever to retract and project the bolt, together with a cooperating push button operated electrical combination lock having electrical switches which must be activated in a preselected combination to energize a solenoid and retract its plunger from a normal position locking the bolt of the mechanical combination lock against retraction, and electrical means cooperating with the moving parts of the dial operated combination lock to prevent operation of the electrical switches when the dial operated lock is in closed position.

3,559,431
APPARATUS FOR STRETCHING CONTINUOUS BANDS
Oskar Noe and Herbert Lux, Mulheim (Ruhr), Germany, assignors to BWG Bergwerk- und Walzwerk-Maschinenbau G.m.b.H., Duisburg, Germany, a corporation of Germany
Filed Feb. 17, 1969, Ser. No. 799,635
Claims priority, application Germany, Feb. 15, 1968, P 16 52 615.1
Int. Cl. B21b *37/06*
U.S. Cl. 72—8 **12 Claims**

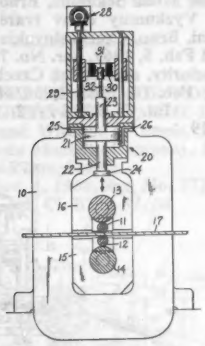


In a tensioning arrangement for the continuous stretching of metallic bands in which an upstream roller assembly frictionally retards the band as it passes through this roller assembly and a downstream roller assembly passes the band at a higher velocity whereby tension is applied to the band between the assemblies. The upstream roller assembly is connected with at least one torque-controlling hydraulic pump whose high-pressure side is connected to the high-pressure side of a torque-controlling hydraulic motor driving the downstream roller assembly. A pressure-regulating pump supplies hydraulic fluid under pressure in common to the high-pressure sides of pump and motor while a counterpressure pump is provided in the return line from the commonly connected low-pressure sides of torque-controlling pump and motor. When the roller assemblies each include a number of rolls about which the band is passed with as large a contact angle as possible, the rolls of the upstream assembly have hydraulic pumps of progressively increasing torque output whereas the rolls of the downstream assembly traversed in succession by the band have hydraulic motors of correspondingly stepped decreasing torque.

3,559,432
ROLL GAP GAGE CONTROL
Telesfore Rastelli, Cheshire, Conn., assignor to Textron, Inc., Providence, R.I., a corporation of Delaware
Filed May 29, 1968, Ser. No. 732,998
Int. Cl. B21b *37/08*
U.S. Cl. 72—19 **13 Claims**

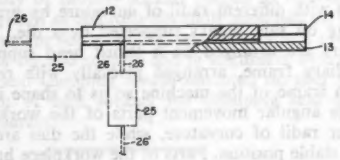
A mill having a plurality of work rolls, said mill having hydraulic screwdown means and position control means for said hydraulic screwdown means for controlling the hydraulic screwdown means to set the gap between said work rolls. In particular, this invention provides a first means for deriving a first signal indicative of the load

on said work rolls, and second means for combining said first signal with a second signal from said position control



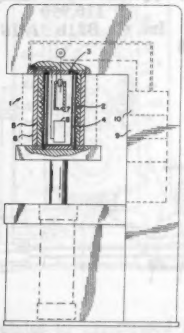
means to derive an error signal to effect constant roll gap control by controlling the hydraulic screwdown means.

3,559,433
LEAD BENDING DEVICE
James R. Brown, 5122 Flintridge Drive, Hyattsville, Md. 20784, and William F. Lusk 9917 Dolby Ave., Glenn Dale, Md. 20769
Filed Aug. 10, 1967, Ser. No. 659,733
Int. Cl. B21f *27/14*
U.S. Cl. 72—36 5 Claims



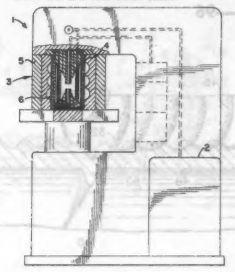
A gauge for measuring and bending strands of material into desired lengths comprised of simple component parts for measuring and bending the strands to a desired length.

3,559,434
CONDUCTIVE EXPLOSIVE GAS TRIGGER FOR ELECTROHYDRAULIC FORMING
Henry J. Keinanen, Hickory Hills, Ill., assignor to Continental Can Company, Inc., New York, N.Y., a corporation of New York
Filed Sept. 25, 1968, Ser. No. 762,456
Int. Cl. B21d *26/14*
U.S. Cl. 72—56 12 Claims



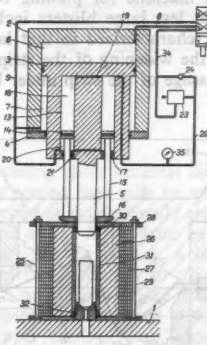
A device for the generation of an ionized conductive gas pathway between two electrodes. A combustible gas is collected at one electrode where it is ignited. On ignition the gas jets toward the other electrode to form an ionized conductive pathway between the two electrodes and an electrical impulse is conducted by this pathway to give rise to an explosion which may be used for forming a sheet of metal.

3,559,435
LIQUID BRIDGE WIRE
Howard L. Gerber, Park Forest, Ill., assignor to Continental Can Company, Inc., New York, N.Y., a corporation of New York
Filed Sept. 25, 1968, Ser. No. 762,448
Int. Cl. B21d *26/14*
U.S. Cl. 72—56 12 Claims



An electrohydraulic system having two electrodes spaced in water and a very small conduit through one electrode to direct a thin stream of conductive liquid from that electrode to another electrode so that any discharge across the electrode follows the path provided by the conductive liquid.

3,559,436
PRESS FOR HYDROSTATIC EXTRUSION
Jan Nilsson, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Oct. 28, 1968, Ser. No. 771,196
Claims priority, application Sweden, Nov. 1, 1967, 14,953/67
Int. Cl. B21c *23/08*
U.S. Cl. 72—60 8 Claims



A hydraulic press has a main operating cylinder with an operating piston slidable therein and an extrusion cylinder with a die at one end and an extruding piston rigid with the operating piston entering the other end. The extrusion cylinder has a sheath wound around it, end pieces enclosing the sheath and seals between the end

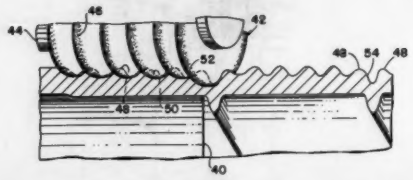
pieces and the ends of the extrusion cylinder. A ring engaging the upper end piece is pressed downward against it by auxiliary pistons slidable in cylinders formed in the operating piston to compress the seals between the end pieces and the ends of the cylinder.

3,559,437

METHOD AND APPARATUS FOR MAKING HEAT TRANSFER TUBING

James G. Withers, Jr., Dearborn, Mich., assignor, by mesne assignments, to Universal Oil Products Company, Des Plaines, Ill., a corporation of Delaware

Original application June 26, 1967, Ser. No. 648,662, now Patent No. 3,481,394. Divided and this application Nov. 4, 1968, Ser. No. 773,065
Int. Cl. B21d *13/02*
U.S. Cl. 72—96 4 Claims



Method and apparatus for making heat transfer tubing characterized by the use of external roll means operating against an internal mandrel to produce a plurality of external helical grooves and fins or ribs in conjunction with additional roll means operating beyond the end of the internal mandrel to deepen an external groove and to produce an internal helically extending rib.

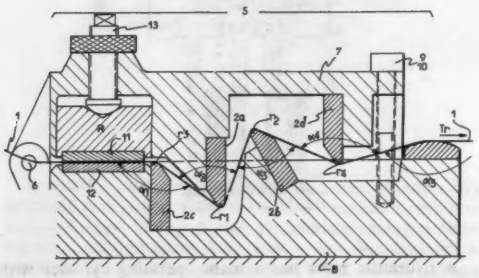
3,559,438

METHOD OF PLANING THIN METALLIC STRIPS AND CORRESPONDING PLANING DEVICE

Georges Rouyer, Paris, and Gaston Fontaine, Chatenay-Malabry, France, assignors to Nord-Aviation Societe Nationale de Constructions Aeronautiques, Paris, France, a joint-stock company of France

Filed July 29, 1968, Ser. No. 748,392
Claims priority, application France, July 31, 1967, 116,384
Int. Cl. B21d *1/06*
U.S. Cl. 72—160 4 Claims

Method and machine for planing thin metallic strips having more or less large blisters included in adjoining strained zones, characterized in that lateral strains, with a tendency to the widening of the strip, are produced by the angular passage of the strip under longitudinal stress,



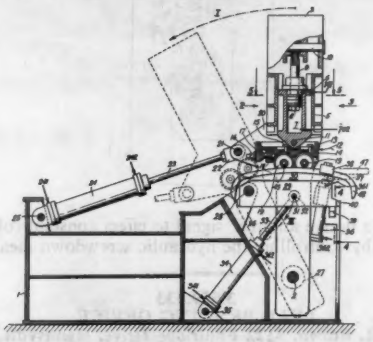
over at least one radiated edge of a planing tool, in order to obtain a resorption of the blisters by recompression of the latter with overstepping of the elastic limit.

3,559,439

ARRANGEMENT FOR SHAPING OF PROFILED CURVED WORKPIECES FROM BLANKS

Miloslav Zák and Milan Sekanina, Brno, Czechoslovakia, assignors to Vyzkumny ustav tvarecich stroju technologie tvareni, Brno, Czechoslovakia

Filed Feb. 5, 1969, Ser. No. 796,785
Claims priority, application Czechoslovakia, Feb. 10, 1968, 1,036/68
Int. Cl. B21d *7/02*
U.S. Cl. 72—219 7 Claims



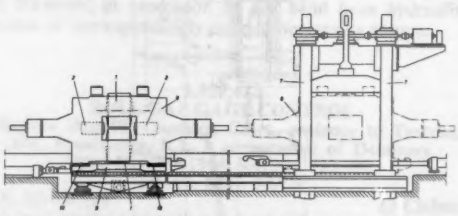
An arrangement for shaping of profiled curved workpieces from blanks to a configuration with adjacent sections with different radii of curvature by pressure rollers acting on said blanks supported by a die. The pressure rollers are arranged on a thrust head supported by an auxiliary frame, arranged pivotally with respect to the main frame of the machine so as to shape in the course of its angular movement parts of the workpiece having larger radii of curvature, while the dies are maintained in a stable position. Parts of the workpiece having smaller radii of curvature are shaped by imparting to the support of said die a rotating movement around an axis substantially coincident with the centres of curvature of said part while the housing of pressure rollers acting on said part remains substantially stable.

3,559,440

UNIVERSAL ROLLING MILL

Karl G. Illert, Neuss, Germany, and Takamitsu Ando and Itsuro Miida, Kurashiki, Japan, assignors to Siegener Maschinenbau G.m.b.H., a corporation of Germany, and Kawasaki Steel Corporation, Kobe, Japan, a corporation of Japan

Filed July 11, 1968, Ser. No. 744,226
Claims priority, application Germany, July 25, 1967, S 110,990
Int. Cl. B21b *31/10*
U.S. Cl. 72—238 5 Claims



A pass line adjustment for the rolls of a universal rolling mill relative to an associated roller table. Adjustment of the mill pass line is accomplished by shims, threaded

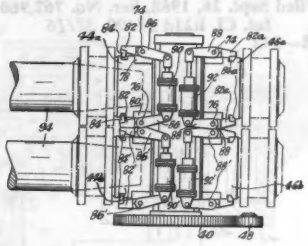
spindles, wedges, or piston cylinder assemblies arranged between a cassette frame carrying both pairs of horizontal and vertical rolls and a roll changing sled slidably received into the mill housing.

3,559,441

ROLL CHANGING DEVICE FOR ROLL LEVELER, STRAIGHTENER AND THE LIKE

Herbert Lemper and William E. Ennis, Pittsburgh, Pa., assignors to Mesta Machine Company, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Nov. 1, 1968, Ser. No. 772,721
Int. Cl. B21b *31/08*
U.S. Cl. 72—239 10 Claims



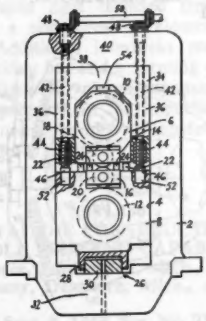
We disclose a roll changing device for a roll straightener and the like, said device comprising a support structure, a plurality of tubular sockets shaped to receive respectively portions of the rolls normally mounted on said straightener, means for mounting said sockets in a predetermined array on said support and in alignment with said straightener, and clamping means mounted on said support for each of said sockets for clamping said rolls respectively therein.

3,559,442

PRESTRESSED ROLLING MILLS

Edwin Simmonds, Ringwood, and Tom Smith, Parkstone, England, assignors to Loewy Robertson Engineering Company Limited, Bournemouth, England, a corporation of Great Britain

Filed Feb. 9, 1968, Ser. No. 704,334
Claims priority, application Great Britain, Feb. 28, 1967, 9,559/67
Int. Cl. B21b *31/24*
U.S. Cl. 72—240 4 Claims



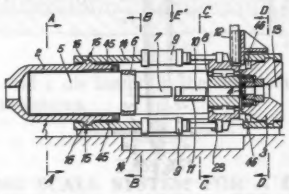
This disclosure relates to prestressed rolling mills of the type in which the pass opening between the working rolls of the mill is set by spacing means which are displaceable relative to the bearing chocks of one roll of the mill and rest with their ends on the bearing chocks of another roll. The spacing means may operate either on the bearing chocks of the working rolls of the mill or on the bearing chocks of any back-up rolls for the working rolls.

3,559,443

PRESSES, AND PARTICULARLY EXTRUSION PRESSES

Ernst Petsch, Mettmann, Germany, assignor to Maschinenfabrik Sack G.m.b.H., Dusseldorf-Rath, Germany

Filed Feb. 15, 1968, Ser. No. 705,823
Claims priority, application Germany, Feb. 17, 1967, M 72,806
Int. Cl. B21c *23/00*
U.S. Cl. 72—253 11 Claims



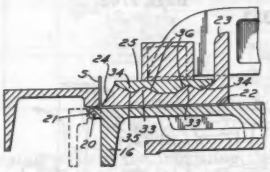
A press in which the press cylinder and die support beams are tied together by two or more segments extending part way but less than 180° around the axis of the cylinder.

3,559,444

BRAKE FOR BENDING SHEET MATERIAL

Lawrence E. Blazey and Walter G. Marsh, Detroit, Mich., assignors to Tapco Products Company, Inc., Detroit, Mich., a corporation of Michigan

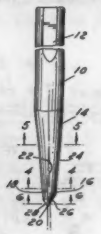
Filed Mar. 4, 1968, Ser. No. 710,326
Int. Cl. B21d *11/04*
U.S. Cl. 72—319 14 Claims



The brake for bending sheet material disclosed herein comprises a pair of spaced base rails on which C-shaped members are positioned at longitudinally spaced points. A first member is fixed on the lower arms of the C-shaped members and has a clamping surface. A second member having a bending surface is hinged to the first member. An anvil member is provided over the clamping surface and a pressure member is interposed between the anvil member and the upper arms of the C-shaped members. The pressure member has wedges thereon which function when the pressure member is translated longitudinally to apply pressure to the anvil member. A handle is pivoted to the first member at one end and is operatively connected to the pressure member for shifting the pressure member. Complementary longitudinally extending ribs and valleys are provided between the surfaces of the pressure member and anvil member. An electrical strip heater

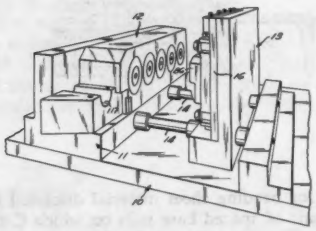
is hinged to the C-shaped members and is movable into a position adjacent the hinge line for heating the bending point of material where the material to be bent is made of plastic such as vinyl sheet.

3,559,445
PIERCING TOOL FOR SHEET MATERIAL
Everett D. Hougen, G–5072 Corunna Road, Flushing, Mich. 48504
Filed May 6, 1968, Ser. No. 726,856
Int. Cl. B21d *31/02, 37/00, 28/26, 28/34*
U.S. Cl. 72—325 **10 Claims**



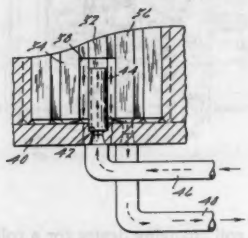
A tool for piercing holes in sheet material, such as sheet metal, plastic, etc., having a tapered portion terminating in a point. The tapered portion having at least one blunt tapered edge which extends down to the pointed end of the tool which projects radially from the rotating axis of the tool a greater extent than the remaining surface portion of the tapered portion of the tool.

3,559,446
FORGING MACHINE
Harry A. Dom and Gene E. Allebach, Tiffin, Ohio, assignors to The National Machinery Company, Tiffin, Ohio, a corporation of Ohio
Filed Mar. 29, 1968, Ser. No. 717,264
Int. Cl. B21d *28/00, 45/00;* **B21j** *9/00, 13/02, 13/04;* **B21k** *1/48*
U.S. Cl. 72—337 **14 Claims**



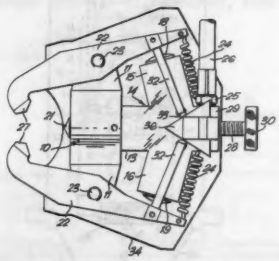
A five station progressive cold former is disclosed which is arranged to permit relatively quick tool changeover. The die breast, the bolster plate and the shear elements are removably clamped in the machine by hydraulically-operated clamp actuators. A knockout mechanism is provided with a cam drive which includes cam sectors that can be removed and replaced without material disassembly of the cam drive. An adjustable tube nut is threaded into the machine to adjustably determine the rearward position of the knockout mechanism. Power means are provided for the adjustment of the tube nuts. The separate fixtures are provided to permit installation of tooling and rough adjustment thereof on a die breast and bolster assembly separate from the machine. The machine is arranged so that a tooling change can be accomplished before the machine cools to environmental temperature so that warm-up adjustment requirements are minimized.

3,559,447
INCREMENTAL DIE CONSTRUCTION WITH INTERNAL FLOW PASSAGES FOR LOCALIZED TEMPERATURE CONTROL
Harold N. Bogart, Farmington, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware
Filed Sept. 26, 1968, Ser. No. 762,960
Int. Cl. B21d *37/00, 37/16*
U.S. Cl. 72—342 **4 Claims**



A die comprising two complementary die sections, each section comprising a plurality of hexagonal rods situated in registry, the lengths of the rods being predetermined prior to assembly, said rod ends being contiguous and forming increments of a continuous die surface, and a fluid flow passage formed in part by the foreshortening or removal of one or more selected rods, thereby permitting the flow of temperature controlling fluid through selected areas of the die section.

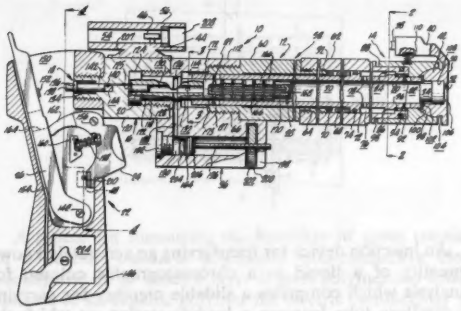
3,559,448
DEVICE FOR ATTACHING METAL FITTINGS TO ELECTRICAL CONDUCTORS OR THE LIKE
Duncan Illingworth and John Iceton, Leeds, England, assignors to Cable Covers Limited, Surbiton Surray, England, a corporation of the United Kingdom
Filed Aug. 12, 1968, Ser. No. 752,008
Claims priority, application Great Britain, Feb. 14, 1968, 7,249/68
Int. Cl. B21d *9/08*
U.S. Cl. 72—410 **5 Claims**



A device for fixing a malleable metal fitting to an electrical conductor or other cable comprises three indenting elements, one on an hydraulic piston and two respectively on pivoted arms which extend in the same general direction as that of the piston. Other hydraulic means

operate the arms so that operation of the piston and the other hydraulic means causes the three indenting elements to close upon and indent the fitting with positive pressure at three spaced points and cause portions of the fitting to engage or to penetrate interstices of the cable.

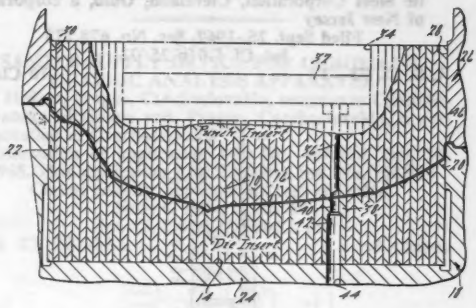
3,559,449
EXPLOSIVELY ACTUATED RIVET GUN
John C. Steinmetz, Pasadena, Calif., assignor to VSI Corporation, Pasadena, Calif., a corporation of Delaware
Filed Nov. 19, 1968, Ser. No. 777,088
Int. Cl. B21j *15/00*
U.S. Cl. 72—430 **51 Claims**



A barrel assembly of an explosively actuated rivet gun includes a barrel housing and an inner, longitudinally displaceable barrel within the housing. A translatable impacting hammer is disposed within the inner barrel for striking a rivet forming punch at the muzzle end of the gun. Porting in the inner barrel provides for its movement in response to gas pressure toward the breech end of the gun and the venting of exposive generated gases. An impacting hammer return port in the inner barrel admits gases ahead of the impacting hammer to force it back to the breech end of the gun. The porting also produces gas biasing of a nose assembly against the sheets being riveted to eliminated the effect of gun recoil. The impacting hammer, through inertia separation, prolongs the transfer of its upsetting impact to a rivet. The forming punch has a frusto-conical recess for upsetting and constricting expansion of a rivet. The nose assembly has a universally rotatable head with a parabolic mirror that is maintained out of alignment with a light source on the breech assembly until the nose assembly is properly aligned, whereupon light reflected from the parabolic mirror energies a photosensitive element to unlock the gun's trigger. Additional interlocks prevent gun firing until a rivet bucking bar and a forming die are in proper position. An adjustable volume expansion chamber controls explosive pressure on the impacting hammer and, therefore, the upsetting impact transferred through the forming punch to a rivet.

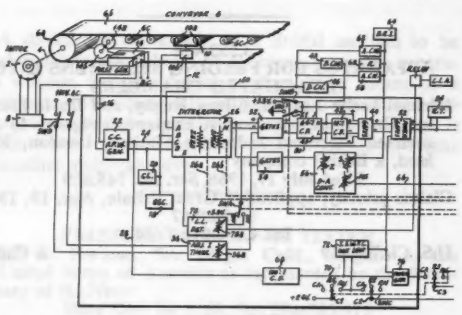
3,559,450
INCREMENTAL DIE CONSTRUCTION HAVING A HOLE PIERCING CAPABILITY
Foster E. Whitacre, Farmington, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware
Filed Sept. 9, 1968, Ser. No. 758,360
Int. Cl. B21d *37/00*
U.S. Cl. 72—464 **4 Claims**

A die construction for forming sheet metal, the punch section and the complementary die section being formed of integrated hexagonal rods, the rods of the respective die sections being in aligned registry, the ends of the rods being formed with surfaces having precalibrated surface normals, selected rods being adapted to accommodate a



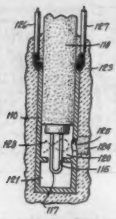
die punch and a die button in the complementary metal forming die sections.

3,559,451
WEIGHING SCALE SYSTEM FOR A CONVEYOR WITH FOOTAGE COUNTER FOR IMPROVED CALIBRATION
Frank S. Hyer, Duxbury, and Raymond Karosas, Quincy, Mass., assignors to Cutler-Hammer, Inc., Milwaukee, Wis., a corporation of Delaware
Filed Dec. 22, 1969, Ser. No. 886,856
Int. Cl. G01g *11/14*
U.S. Cl. 73—1 **7 Claims**



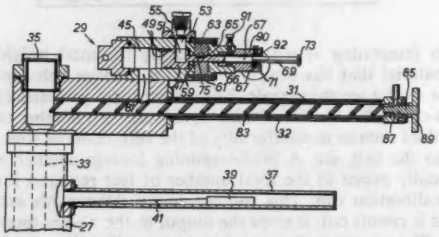
An integrating system for indicating the total weight of material that has been moved by an endless belt-conveyor over a weighing scale. The system must periodically be re-calibrated for "zero" and "span" due to a number of variables such as nonuniformity of the belt, material sticking to the belt, etc. A predetermining footage counter is manually preset to the total number of feet required for the calibration run. This counter counts downwards and when it counts out, it stops the output to the weight totalizer. The system is first run for a zero calibration and if the reading is off, the zero adjusting device is turned in the proper direction until the reading is close enough on a re-run. The system is then run for a span calibration and if the reading is off, the non-interacting span adjusting device is turned in the proper direction until the reading is close enough on a re-run. In each case, the footage counter precisely controls the amount of conveyor footage that is totalized to avoid laborious manual measurement and computation. Other features such as rate indication, low level detection, closed loop controls and timed interlocking between the integrator output and the conveyor motor control, and the like, are incorporated into the system.

3,559,452
THERMAL ANALYSIS OF MOLTEN STEEL
Gottfried W. Perbix, Chagrin Falls, Dale J. Maczka, Independence, Cecil B. Griffith, North Royalton, and Pesi N. Dastur, Brecksville, Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio, a corporation of New Jersey
Filed Sept. 25, 1967, Ser. No. 670,273
Int. Cl. G01n 25/02
U.S. Cl. 73—17 10 Claims



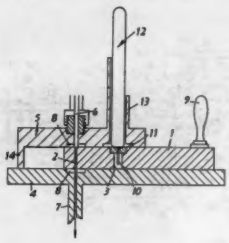
Insertable probes for thermal analysis of molten metal comprise a sampling chamber constituted of chill metal such as steel, enclosing a thermocouple and mounted for insertion into the molten metal, with surrounding material such as heavy cardboard or refractory, to impede destruction of the chamber. Protected conductors for the thermocouple extend out of the furnace to the translating device. The molten metal enters the chamber through an opening at or near the top, the chill metal functioning to freeze the received sample. For special reliability an entrance chamber, also surrounded with chill metal and containing the kill metal, is traversed by the entering sample enroute to the test chamber below.

3,559,453
APPARATUS FOR FEEDING SPECIMENS INTO EVACUATED CHAMBERS
Michael Leslie Aspinal, Bilton, Rugby, and David Hazelby, Grandborough, Rugby, England, assignors to Associated Electrical Industries Limited, London, England, a British company
Filed July 17, 1968, Ser. No. 745,609
Claims priority, application Great Britain, Apr. 19, 1967, 17,984/67
Int. Cl. G01n 7/14
U.S. Cl. 73—19 6 Claims



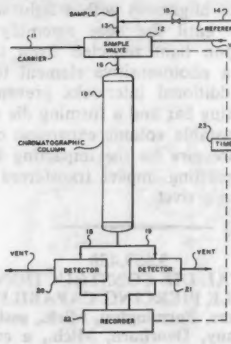
Apparatus for feeding specimens into an evacuated chamber comprises a vacuum lock having a specimen carrier piston movable within a gas-tight cylinder between a first position at which the specimen is inserted in a space in the carrier, a second position at which the carrier space is exposed to a rough vacuum, and a third position at which the carrier space communicates with the high vacuum of the chamber for the discharge of the specimen. In combination with this vacuum lock, such apparatus can include a specimen storage and transfer device in the form of a magazine into which the specimens are deposited from the vacuum lock and which is rotatable within a hollow compartment communicating with the said evacuated chamber for the transfer and discharge of the specimen.

3,559,454
FEEDING OF LIQUID TO GAS LIQUID CHROMATOGRAPHIC COLUMNS
William David Evans, 14 Village Close, Edwalton Village, Nottingham, Nottinghamshire, England
Filed Nov. 26, 1968, Ser. No. 779,187
Claims priority, application Great Britain, Dec. 7, 1967, 55,808/67
Int. Cl. G01n 1/14, 31/08
U.S. Cl. 73—23.1 2 Claims



An injection device for transferring an accurately known quantity of a liquid to a chromatographic column for analysis which comprises a slidable member for carrying a capillary tube between a loading station, at which the tube containing the liquid is introduced into the slidable member, and an injection station at which the tube is in communication with a carrier gas stream which conveys the liquid into the column. The slidable member has two passages therethrough, one carrying the capillary tube and the other to allow carrier gas to flow through the member when the said one passage is at the loading station. A holding means is provided at the loading station to hold the capillary tube temporarily until the slidable member is moved.

3,559,455
CHROMATOGRAPHIC ANALYSIS
Francis W. Karasek, Waterloo, Ontario, Canada, assignor to Phillips Petroleum Company, a corporation of Delaware
Filed Oct. 30, 1968, Ser. No. 771,785
Int. Cl. G01n 31/08
U.S. Cl. 73—23.1 5 Claims



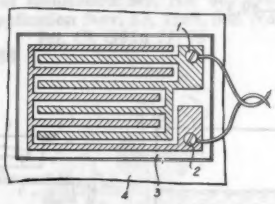
In order to identify components in the effluent from a chromatographic column, a reference material is introduced into the column with the sample. The column effluent is split and passed to a conventional detector and to a detector which is capable of selectively measuring components of the reference material. The output signals

from the two detectors are compared so that sample components can be identified by their retention times with respect to the reference material.

3,559,456
SENSOR FOR MEASURING HUMIDITY

Franz Lomker, Hofheim, Taunus, Felix Schmieder, Frankfurt am Main, and Martin Rieber, Schonberg, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed May 1, 1967, Ser. No. 634,851
Claims priority, application Germany, May 3, 1966, F 49,095
Int. Cl. G01n *31/00*
U.S. Cl. 73—29 8 Claims

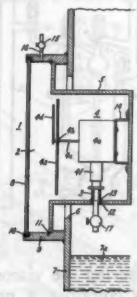


A sensor for measuring the humidity of gases consists of a carrier which is practically non-conductive electrically and on to which a layer is graft polymerized which consists of an organic polymer the electric conductivity of which is a function of the relative humidity. Electrodes are provided on the carrier before or after grafting by the methods known for preparing printed circuits. The layer of the organic polymer grafted on to the carrier is obtained from polymerizable monomers or prepolymers which contain hydrophilic groups in their molecules. As carrier materials which may have the shape of plates, sheets or fabrics organic polymers, especially polyolefins or linear polyesters can be used as well as inorganic substrates which are susceptible to a grafting reaction. The sensor is suitably arranged as part of a circuit for measuring high ohmic resistors.

3,559,457
HYDROGEN DETECTOR

Ralph L. Collins, Rome, Ga., assignor to General Electric Company, a corporation of New York

Filed Nov. 20, 1969, Ser. No. 878,290
Int. Cl. G01n *31/06*
U.S. Cl. 73—23 11 Claims

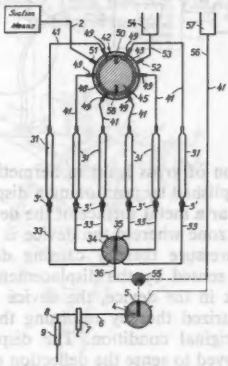


A transformer tank hydrogen detector comprises an instrument housing mounted to form a wall portion of the tank. Disposed inside the housing and communicating with an aperture therein is a tubular detecting element having a surface communicating with the interior of the tank. The tubular detecting element is formed of a palladium alloy which will expand in the presence of hydrogen. Indicator means are connected to the tube and display the amount of its axial expansion. Valve means are utilized to introduce a standard gas into the housing for calibration purposes. Alarm means and temperature regulating means may also be utilized.

3,559,458
SAMPLE-SUPPLY DEVICE FOR CHROMATOGRAPHIC ANALYSIS APPARATUS

Jiří Hrdina, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia, a corporation of Czechoslovakia

Continuation of application Ser. No. 499,544, Oct. 21, 1965. This application Aug. 29, 1968, Ser. No. 764,010
Claims priority, application Czechoslovakia, Nov. 4, 1964, 6,128/64
Int. Cl. G01n *21/08, 31/06*
U.S. Cl. 73—23.1 2 Claims

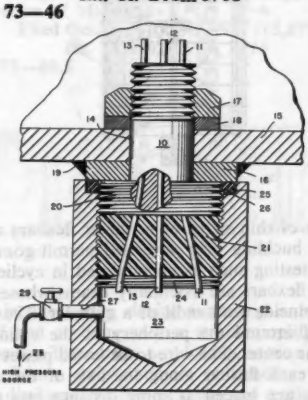


A device for the supply of a fluidal medium to be analyzed into the column of a chromatographic apparatus wherein the said fluidal medium is by means of a multiway valve alternately supplied with an eluent medium to a capillary sample receptacle from which it is fed into the column alternately with an eluent by means of another multiway valve.

3,559,459
PRESSURE RESISTANCE TESTER

Willis R. Forman, San Diego, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Dec. 16, 1968, Ser. No. 783,975
Int. Cl. G01m *3/02*
U.S. Cl. 73—46 1 Claim



A pressure resistance tester for checking the pressure resistance of pass-through fittings or other closures sub-

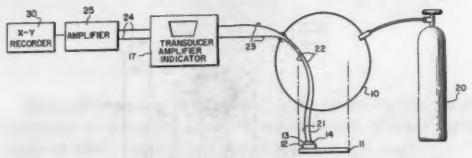
ject to extreme pressures comprising a pressure chamber having internal threads adapted to threadingly engage one end of the pass-through fitting or closure and also adapted to receive a source of pressure which approximates the working pressure to which the pass-through fitting or closure will be subjected in actual practice.

3,559,460

METHOD AND APPARATUS FOR DETECTING GROSS LEAKS

John W. Orner, Woburn, Mass., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Feb. 24, 1969, Ser. No. 801,660
Int. Cl. G01m *3/36*
U.S. Cl. 73—49.3 **7 Claims**



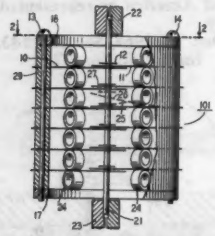
The detection of gross leaks in hermetically sealed devices is accomplished by positioning a displacement transducer on or near a metal surface of the device. The device is placed in a zone wherein the device is subjected to increased gas pressure thereby causing deflection of the surface being sensed by the displacement transducer. If there is a leak in the device, the device will become internally pressurized thereby returning the deflected surface to its original condition. The displacement transducer is employed to sense the deflection of the surface as it occurs.

3,559,461

APPARATUS AND METHOD FOR TENSION-COMPRESSION TESTING OF WIRE

Thomas D. Dudderar, Madison, Alfred Fox, Parsippany, and Gerd F. H. Weissmann, Florham Park, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed Sept. 17, 1969, Ser. No. 858,798
Int. Cl. G01n *3/32*
U.S. Cl. 73—92 **10 Claims**



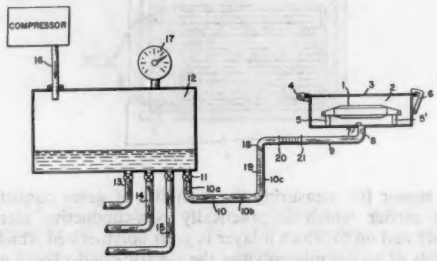
A number of thin strips of metal or flexbars are used to eliminate buckling of a wire and permit compressive stress-strain testing such as encountered in cyclic fatigue testing. The flexbars are essentially beams whose axes of symmetry coincide with radii of a cylinder. The flexbars are mounted around the periphery of the cylinder and overlap at the center. The wire to be tested passes through a hole into each flexbar along the axis of the cylinder. The flexbars are spaced at some distance less than the critical length for buckling for the wire and are adjusted to apply a small lateral force to the wire in various directions in planes normal to the wire axis and along the flexbar axes. Thus, the wire is kept from buckling under axially applied compressive forces. The thin flexbars offer negligible resistance to lateral or axial expansion or contraction of the wire.

3,559,462

APPARATUS FOR CHECKING WATERPROOFNESS, ESPECIALLY THAT OF TIMEPIECE CASES

Jean-Claude Beuchat, 48 Avenue Blanc, Geneva, Switzerland

Continuation-in-part of application Ser. No. 632,990, Apr. 26, 1967. This application Apr. 23, 1969, Ser. No. 818,772
Claims priority, application Switzerland, May 13, 1966, 6,948/66
Int. Cl. G01m *3/02*
U.S. Cl. 73—49.3 **2 Claims**



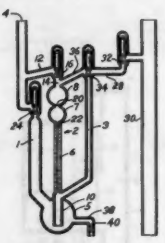
An apparatus for testing the leakage of sealed containers, particularly that of watch cases is described. The case is placed in an airtight enclosure of known volume, which is subjected to a predetermined pressure. A liquid level gauge, in communication with the enclosure indicates the extent of penetration of the pressurized atmosphere surrounding the test sample and consequently, the conditions of leakage.

3,559,463

VISCOMETERS

Theodore Tovrog, Chicago, and Arthur A. Krawetz, Evanston, Ill., assignors to Phoenix Chemical Laboratory Inc., a corporation of Illinois

Filed June 2, 1969, Ser. No. 829,272
Int. Cl. G01n *11/04*
U.S. Cl. 73—55 **16 Claims**



Viscometers for measuring the viscosity of liquids including volatile liquids comprise a pressure inlet tube communicating with a plenum and a measuring bulb and capillary also communicating with the plenum. When determining viscosity, the pressure is equalized between the bulb and the lower end of the capillary. A conduit may be provided to continuously divert a portion of a flowing liquid stream through the bulb and capillary to continuously purge the viscometer and monitor the stream. When the viscosity is to be measured, the diverted

stream is interrupted and the pressure equalized both above the bulb and below the capillary and the viscosity of the purging liquid remaining in the bulb is determined. The liquid level in the plenum may be controlled within a predetermined range such that the capillary communicates with the plenum above the maximum liquid level and the liquid may be discharged from the plenum and returned to the flowing liquid stream.

3,559,464

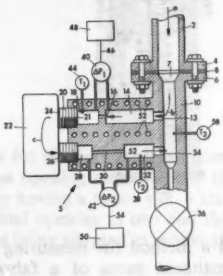
RHEOMETER FOR CONTINUOUS MONITORING OF A PLASTIC

Charles W. Foust, Berkeley Heights, and Wladimir Philippoff, Cranford, N.J., assignors to Esso Research and Engineering Company, a corporation of Delaware

Continuation of application Ser. No. 667,496, Sept. 13, 1967. This application Nov. 13, 1969, Ser. No. 871,618

Int. Cl. G01n *11/08*

U.S. Cl. 73—55 **6 Claims**



The viscosity and shear modulus of viscoelastic materials are determined by measuring the pressure drop across two capillary tubes in series connection. The second capillary tube is elongated, and both tubes are of uniform diameter throughout their lengths. The material is forced through the tubes by a gear pump at a known constant rate of shear independent of the viscosity of the viscoelastic material being tested.

3,559,465

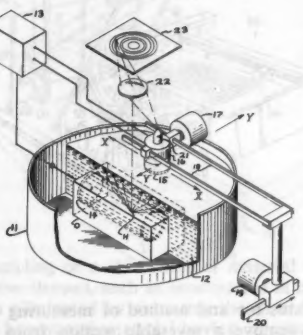
APPARATUS FOR CONSTRUCTING A HOLOGRAM USING ACOUSTICAL RADIATION

Kendall Preston, Jr., New Haven, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn., a corporation of New York

Filed May 24, 1967, Ser. No. 640,881

Int. Cl. G01n *29/04*

U.S. Cl. 73—67.5 **9 Claims**



A method and apparatus for constructing a hologram using sound waves as the form of radiation energy. A single frequency electrical signal is converted into a coherent beam of sound waves. The sound waves are directed towards and ensonify (illuminate) the object being holographed. Sound waves scattered by the object are detected in a reference plane and converted at each location in said plane into an electrical signal. The electrical signal for each location is added to the original electrical signal to produce an electrical output signal proportional to amplitude times the difference in phase angle of the two signals for that particular location. This output signal is in turn used to modulate a lamp whose output is imaged onto a transparency at a location in geometrical registration with the location of the detected signal.

3,559,466

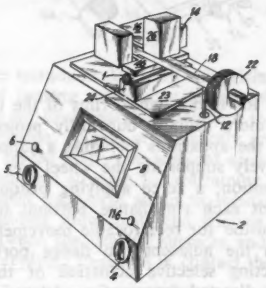
DIRECT READOUT DEFLECTION METER

Donald A. Calleson, Durham, N.C., assignor to Liggett & Myers Incorporated, New York, N.Y., a corporation of Delaware

Filed June 7, 1968, Ser. No. 735,435

Int. Cl. G01n *3/42*

U.S. Cl. 73—81 **13 Claims**



This invention relates to a device for measuring the firmness of a cigarette, cigarette filter rod, or similar test specimen. Basically, the device is a mechanism comprised of an assembly of levers which mount a weight of predetermined mass and an apparatus to accurately measure the firmness of the test specimen. In operation, the weight reacts, through the assembly of levers, to compress the test specimen while the measuring apparatus senses and measures the attendant depression of the test specimen.

3,559,467

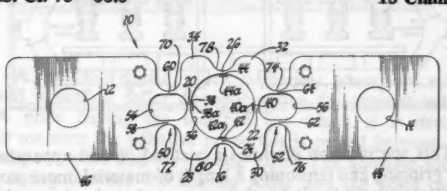
STRAIN MEASURING DEVICE

Ismail Macit Gurol and Ralph S. Shoberg, Farmington, Mich., assignors to GSE, Inc., Farmington, Mich., a corporation of Michigan

Filed Oct. 8, 1968, Ser. No. 765,877

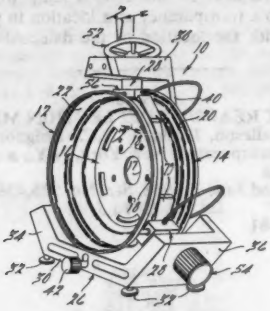
Int. Cl. G01l *1/00, 7/16*

U.S. Cl. 73—88.5 **13 Claims**



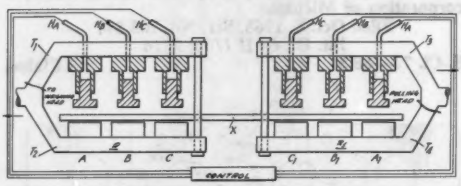
A strain measuring device including a body having a pair of end sections with a strain amplifying section therebetween. The strain amplifying section has a plurality of flexure points subject to bending in response to linear displacement between the end sections. Surface portions adjacent the flexure points are therefore subjected to bending strain of greater magnitude than the average linear strain.

3,559,468
METHOD AND APPARATUS FOR RIM FATIGUE AND TESTING DEVICE
Daniel F. Jansen, Ypsilanti, and Manfred E. Meyer, Ann Arbor, Mich., assignors to Kelsey-Hayes Company, Romulus, Mich., a corporation of Delaware
Filed July 12, 1968, Ser. No. 744,474
Int. Cl. G01n 3/00
U.S. Cl. 73—91 13 Claims



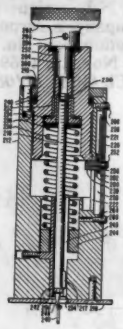
An apparatus for testing wheel rims of the type comprising one or more radially outwardly projecting rim flange portions; the apparatus including a support structure for operatively supporting the wheel rim in a preselected test position; a force applying piston member disposed adjacent each rim flange portion; means for supporting the piston for reciprocable movement toward and away from the adjacent rim flange portion; and means for effecting selective actuation of the piston, whereby axially directed forces of predetermined magnitude are selectively applied against the rim flange portion to determine the fatigue characteristics of the wheel rim.

3,559,469
METHOD AND MEANS FOR TENSILE TESTING MATERIALS
Arthur L. Stonebridge, Shipley, and Malcolm Ellison, Batley, England, assignors to BBA Group Limited, Yorkshire, England, a British company
Filed Nov. 1, 1968, Ser. No. 772,625
Claims priority, application Great Britain, Nov. 3, 1967, 50,090/67
Int. Cl. G01n 3/08
U.S. Cl. 73—95 10 Claims



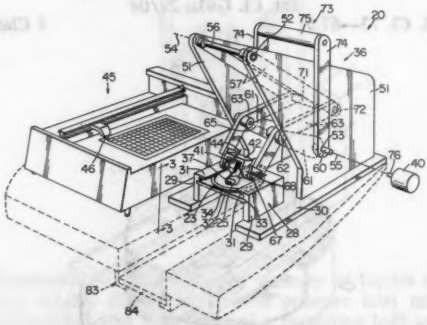
This specification discloses a method of and apparatus for gripping and tensioning a length of material, more particularly tensioning it for the purpose of testing its tensile strength. The material is gripped by inserting each of two of its opposing end portions into at least one array of clamps, each array comprising at least two clamps aligned one behind the other in the direction of the opposing pulling forces, by tightening at least the two outermost clamps onto the material which is then tensioned in successive steps in such a fashion that although the material between each outermost clamp and its adjacent clamp towards the centre portion of the material is pre-tensioned it is in fact only the portion of material located between the two innermost clamps of the opposing arrays which is subjected to the desired ultimate tension.

3,559,470
YARN DEGRADATION TESTERS
John R. McDowell, Knoxville, Tenn., assignor to Huyck Corporation, Rensslaer, N.Y., a corporation of New York
Filed Sept. 6, 1968, Ser. No. 757,894
Int. Cl. G01n 3/14, 3/20
U.S. Cl. 73—95.5 7 Claims



An apparatus and a method for measuring the tensile strength of the constituent yarns of a fabric material whereby the yarn which is being tested is moved substantially at right angles to the axis thereof by yarn engaging means against a restraining force exerted by a material engaging means which continuously enages one surface of the material being tested, while the force applied to the yarn is being measured.

3,559,471
APPARATUS FOR AND METHOD OF TESTING A SEVERABLE SECTION IN A WALL
Dennis A. Schaffer, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va., a corporation of Delaware
Filed June 6, 1969, Ser. No. 831,148
Int. Cl. G01n 3/00
U.S. Cl. 73—96 22 Claims



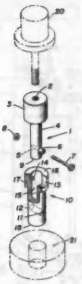
An apparatus for and method of measuring the force required to remove a severable section from its associated wall wherein the force exerted against the section to provide a severing thereof is exerted in an arcuate path substantially identical to the path normally followed in severing the section during ordinary usage.

3,559,472

DEVICE FOR TESTING SHEAR PINS

Byrd T. Thompson, Jr., Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo., a corporation of Delaware

Filed Dec. 30, 1968, Ser. No. 787,918
Int. Cl. G01n *3/24*
U.S. Cl. 73—101 2 Claims



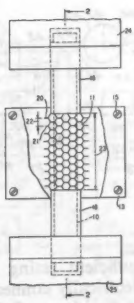
A device for testing shear pins comprising a rod having a transverse opening near one end thereof, and a receiving member having a radial slot, a transverse opening, and a longitudinal opening in one end thereof; said longitudinal opening being adapted to receive the rod.

3,559,473

APPARATUS AND METHOD FOR TENSION-COMPRESSION TESTING OF THIN SHEETS OF MATERIAL

Thomas D. Dudderar, Madison, Philip J. Lauriello, North Plainfield, and Gerd F. H. Weissmann, Florham Park, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed Sept. 29, 1969, Ser. No. 861,754
Int. Cl. G01n *3/04*
U.S. Cl. 73—103 8 Claims



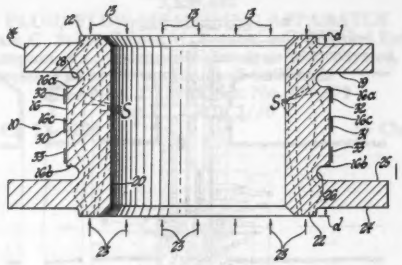
The buckling of a thin sheet of material subjected to compressive stresses, such as encountered in cyclic fatigue testing, is eliminated by mounting the sheet between two layers of honeycomb material having anisotropic stiffness properties. The honeycomb material effectively reduces the critical buckling length of the sheet without introducing significant restraints on lateral expansion of the thin sheet or on the strain rates which may be used.

3,559,474

FORCE TRANSDUCER LOAD CELL

Ismail Macit Gurol and Ralph S. Shoberg, Farmington, Mich., assignors to GSE, Inc., Farmington, Mich., a corporation of Michigan

Filed Oct. 8, 1968, Ser. No. 765,946
Int. Cl. G01l *1/22*
U.S. Cl. 73—141 14 Claims



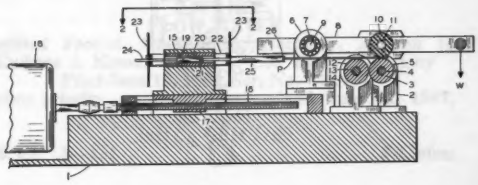
A force transducer load cell comprising a body having a pair of bearing surfaces at its opposite ends for engagement by load applying members to place the body in compression. A pair of outwardly projecting fins are provided on the body, one adjacent each bearing surface, having sufficient strength for restraining the bearing surfaces against transverse strain to substantially eliminate relative sliding movement, and friction resulting therefrom, between the bearing surfaces and the surfaces of the load applying members in contact therewith.

3,559,475

APPARATUS AND METHOD FOR MEASURING THE TACK OF MATERIALS

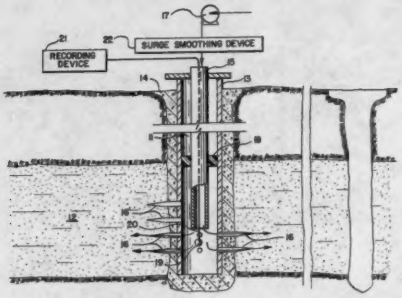
Willis D. Dillon, Ballwin, and Evan W. Pittenger, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

Filed Oct. 17, 1969, Ser. No. 867,207
Int. Cl. G01n *19/04*
U.S. Cl. 73—150 6 Claims



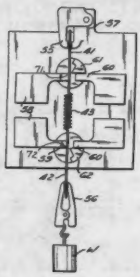
A tackiness tester which comprises a support roller and a sensing roller disposed above the support roller. A plate having the material for which it is desired to measure the adhesive properties is passed between the support roller and the sensing roller. The adhesive forces existing between the sensing roller and the plate cause a frictional drag to movement of the plate. The plate is urged between the rollers by means of a movable housing which carries a linear variable differential transformer. The transformer, core, and plate are connected through a pair of spring plates on the housing so that movement of the plate between the rollers creates a reaction to the frictional drag and causes a shifting of the transformer core with respect to the housing and transformer coil to generate an output current proportional to the adhesive properties.

3,559,476
METHOD FOR TESTING A WELL
Chiang-hai Kuo and Peter Vanmeurs, Houston, Tex., assignors to Shell Oil Company, New York, N.Y., a corporation of Delaware
Filed Apr. 28, 1969, Ser. No. 819,879
Int. Cl. E21b 49/00
U.S. Cl. 73—155 7 Claims



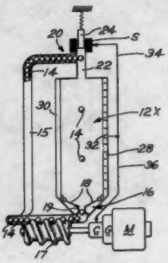
A method for measuring a reservoir property of a porous earth formation adjacent to a well by establishing a pulsating flow of fluid through the well into and out of the earth formation at rates that vary with time in accordance with a predetermined periodic function. The variations with time of the pressure in the well is measured and the phase shift and amplitude of the pressure variations with time relative to the variations with time of the rates of the pulsating flow of fluid is determined.

3,559,477
METHOD OF AND APPARATUS FOR SPRING CALIBRATION
Andrew F. Deming, 12660 Beech St. NE., Alliance, Ohio 44601
Filed Feb. 28, 1969, Ser. No. 803,159
Int. Cl. G01l 1/04
U.S. Cl. 73—161 10 Claims



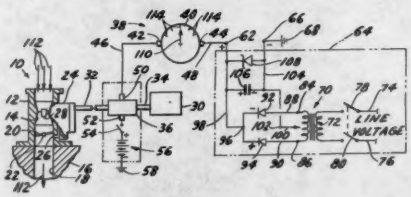
A spring calibration method and apparatus is disclosed to precisely calibrate a spring prior to its assembly into the end-use device. A calibrated weight is hung to act by gravity on a coil tension spring thus stretching it and stressing it to a condition of static equilibrium to support the weight. Two reference points are marked on the end portions of the spring and vices may be used for this purpose to mark the locations of these first and second reference points and also these vices may be used to bend permanent hooks on the end portions so that the spring may be mounted in the end-use device by these hooks. The vices are a precise gauge distance apart so that when the spring is subsequently stressed to have these hooks again spaced apart this predetermined distance, then it will be known that the spring is developing this predetermined force.

3,559,478
INERTIAL SENSING SYSTEM FOR USE IN NAVIGATION AND GUIDANCE
Arthur S. Iberall, Norberta, Pa., assignor to General Technical Services Inc., a corporation of Ohio
Continuation-in-part of application Ser. No. 451,753, Apr. 29, 1965. This application Apr. 5, 1967, Ser. No. 628,652
Int. Cl. C01c 21/16
U.S. Cl. 73—178 5 Claims



An inertial guidance system in which a sequence of free bodies (such as balls) are launched through a sensing chamber affixed to a vehicle. Photoelectric detectors are employed for monitoring the motion of each body. Changes in the position, velocity, or acceleration of the sensing chamber are manifested as apparent departures from the "expected" motion of each body. These departures are translated into electrical signals representative of the motion of the vehicle.

3,559,479
FLUID FLOW GAUGING APPARATUS
Ralph L. Slitti, Detroit, Mich., assignor to Holley Carburetor Company, Warren, Mich., a corporation of Michigan
Filed Dec. 18, 1967, Ser. No. 691,316
Int. Cl. G01f 7/00
U.S. Cl. 73—196 4 Claims



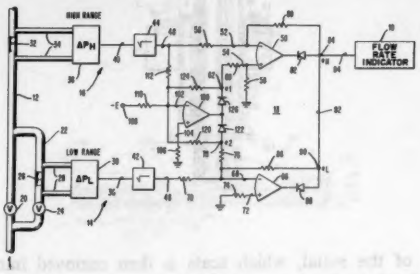
An ammeter, of sufficient rating and sensitivity, has one of its terminals electrically connected to a first source of variable voltage comprising a fluid transducer which produces a first voltage of a magnitude corresponding to the rate of fluid flow therethrough and a second source of reference voltage which produces a second voltage of a predetermined magnitude indicative of a desired rate of fluid flow is electrically connected to an other terminal of said ammeter. The ammeter being effective, upon being exposed to said first and second voltages of equivalent value, to indicate a matching of the fluid flow rate through the transducer to the desired rate of fluid flow.

3,559,480

MULTIRANGE FLOWMETER WITH AUTOMATIC METER SEQUENCING

Justus C. Barber, King of Prussia, and Theron W. Jenkins, Jr., Ambler, Pa., assignors to Leeds & Northrup Company, Philadelphia, Pa., a corporation of Pennsylvania

Filed Dec. 20, 1968, Ser. No. 785,553
Int. Cl. G01f 7/00
U.S. Cl. 73—197 7 Claims



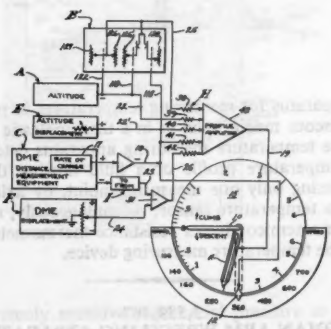
A measurement of fluid flow rate over a wide range is made by using a low range meter and a high range meter and obtaining the output from the low range meter below a transfer point and from the high range meter above the transfer point. The transfer is made in a bumpless manner by biasing the meter outputs in the overlapping portion of their ranges when the meters produce an output beyond a transfer point. The biasing is such that the characteristics of the two meters cross so that equal outputs appear at one point. By selecting the highest absolute outputs of the meters a transfer of the output from one meter to the other occurs in order to utilize the range most accurate for each of the meters.

3,559,481

DESCENT-APPROACH METHOD AND APPARATUS FOR AIRCRAFT

Carl W. Vietor, 2116 Linda Flora Drive, Los Angeles, Calif. 90024

Continuation-in-part of application Ser. No. 650,901, July 3, 1967. This application Sept. 8, 1969, Ser. No. 856,018
Int. Cl. G01c 23/00
U S. Cl. 73—178 12 Claims



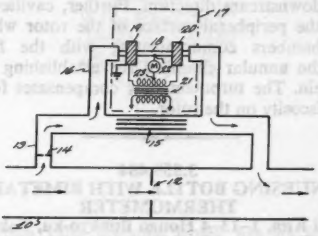
A method and apparatus that utilizes an altimeter indicator output, a speed indicator or equivalent output and a distance measurement output (to a predetermined point or touchdown) operating an instrument panel indicator or servo control of an aircraft relative to a predetermined descent-approach slope. The method and apparatus operates, for example, from cruise position and speeds through all flight phases to and including touchdown position and speeds, and is a total energy concept employing to greatest advantage the kinetic as well as potential energy referred to hereinafter as "aircraft capability" and programming the same for discriminate use by the pilot.

3,559,482

FLUID FLOW MEASURING APPARATUS

William C. Baker, James M. Benson, and Edmond Easter, Hampton, Va., assignors to Teledyne Incorporated, Los Angeles, Calif., a corporation of California

Filed Nov. 27, 1968, Ser. No. 779,579
Int. Cl. G01p 5/10
U.S. Cl. 73—204 20 Claims



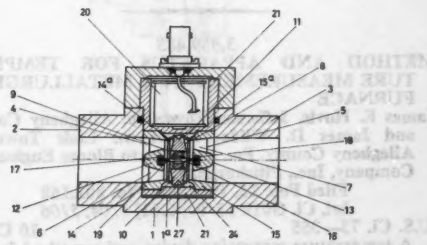
Apparatus for measuring the flow of fluid through a main supply line by the use of a first shunt fluid flow path across a first restrictive element in the main line. The first shunt path includes second and third restrictive elements. A second shunt fluid flow path is connected across the third restrictive element in the first shunt path. The second shunt path includes a conduit at least a portion of which is electrically and thermally conductive, the conductive portion having one or more thermoelectric devices positioned therealong. Heating current is passed through the conductive conduit portion, and the temperature gradient caused by fluid flow through the heated conduit is sensed by the thermoelectric devices to provide an indication of mass flow in the main line substantially independently of pressure and temperature.

3,559,483

FLOW METER

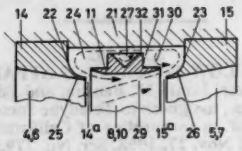
Siegfried Freund, Rheinfelden, Germany, assignor to Endress & Hauser GmbH & Co., Baden, Germany

Filed June 10, 1968, Ser. No. 735,917
Claims priority, application Switzerland, June 12, 1967, 8,382/67
Int. Cl. G01f 1/00
U.S. Cl. 73—231 5 Claims



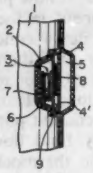
A flow meter is formed of a tubular member providing a flow passageway which contains a pair of stationary guide members disposed on the opposite sides of a rotor.

Vanes are provided in the guide members for the directing the flow of fluid into and away from the rotor. Disposed about the circumferential periphery of the rotor is an annular chamber arranged to provide an opposing force on the rotor to counterbalance the force exerted on



it in the downstream direction. Further, cavities are provided in the peripheral surface of the rotor which form vortex chambers communicating with the fluid flow through the annular chamber for establishing turbulent flow therein. The turbulent flow compensates for the effects of viscosity on the rotor.

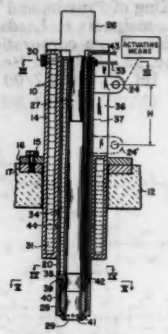
3,559,484
NURSING BOTTLE WITH BIMETAL THERMOMETER
Yasuyoshi Kita, 1–13–4 Hongo Bunkyo-ku, Tokyo, Japan
Filed Apr. 15, 1969, Ser. No. 816,294
Claims priority, application Japan, Apr. 22, 1968, 43/33,385
Int. Cl. G01k *1/14*
U.S. Cl. 73—343 **1 Claim**



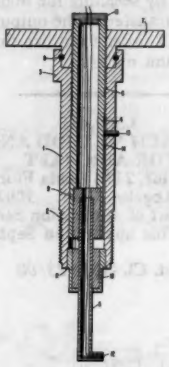
A nursing bottle having a bimetal thermometer which is accommodated within a recessed portion provided at a suitable position in the side wall of the bottle proper. The recessed portion is hermetically sealed off so as to prevent the ingress of outside hot or cool water into the bottle interior. The thermometer mounted in the recessed portion serves to indicate the temperature of the liquid (such as milk) contained in the bottle, making it easier to know an exact temperature of the content.

3,559,485
METHOD AND APPARATUS FOR TEMPERATURE MEASUREMENT IN A METALLURGICAL FURNACE
James E. Hovis, Jefferson Township, Allegheny County, and James D. Wilde, Upper St. Clair Township, Allegheny County, Pa., assignors to Bloom Engineering Company, Inc., Pittsburgh, Pa.
Filed Feb. 25, 1969, Ser. No. 802,168
Int. Cl. G01k *13/04;* **G01j** *5/04, 5/06*
U.S. Cl. 73—355 **10 Claims**

A temperature measuring device and a method for taking solid metal temperatures in a metallurgical furnace comprising a telescoping shield mounted in alignment with a radiation pyrometer and which, just prior to a temperature measurement, extends into the furnace to a point adjacent to the slab. The shield can also be extended in such a manner as to strike the solid metal surface with sufficient impact as to shatter the scale layer on the surface of the metal, which scale is then removed immediately thereafter by means of compressed air jets.



3,559,486
APPARATUS FOR MEASURING TEMPERATURES IN HIGHLY VISCOUS MEDIA
Helmut Gormar, Geistinger Strasse, Hennef, Germany
Filed June 2, 1969, Ser. No. 829,391
Claims priority, application Germany, June 1, 1968, P 17 73 549.8
Int. Cl. G01k *1/14, 7/02, 13/02*
U.S. Cl. 73—359 **20 Claims**

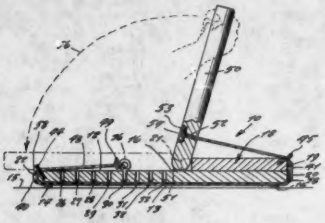


An apparatus for measuring temperatures in preferably highly viscous media, such as in a thermoplastic synthetic melt. The temperature measuring apparatus determines a radial temperature profile of a fluid flowing through a conduit using only one measuring point, by axial adjustment of a temperature sensor. Advantageously, a thermocouple or a semiconductor resistance thermometer can be used as the temperature measuring device.

3,559,487
INDIAN ARM WRESTLING APPARATUS
Frank Parlato, 487 Kirkman Ave., Elmont, N.Y. 11003
Filed Sept. 29, 1969, Ser. No. 863,750
Int. Cl. G01l *5/06*
U.S. Cl. 73—380 **10 Claims**

A strength testing and exercising apparatus for the hand and forearm of a person consisting of a base having legs to elevate the same above a supporting surface. The

base is provided with a row of openings selectively receiving a shank and opposite the innermost opening of the row there is provided an abutment plate having on its forward edge an arcuate recess. A removable upstanding hand held lever in the form of a bar has its lower end rounded to fit in the arcuate recess and engages the upper side of the base encompassed by the recess. A stretchable tension cable is connected at one end to the shank and at its other end to the hand held lever. The



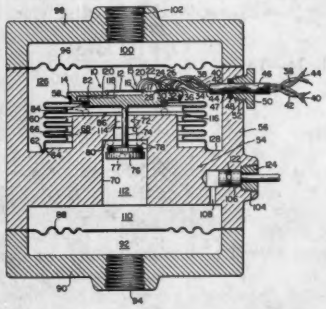
cable passes through suitable guide means at each end of the base and extends along the underside of the base. The degree of force required to swing the hand held lever down towards the upper side of the base is dependent on the selected opening into which the shank is inserted and the angle the lever makes in relation to the base mounting a removable swingable upstanding hand to bring the lever down, the angle being the smallest when the shank is located in the outermost opening which is closest to the forward edge of the base.

3,559,488

DIFFERENTIAL PRESSURE MEASURING APPARATUS

John A. Weaver, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware

Filed Aug. 20, 1969, Ser. No. 851,608
Int. Cl. G01l *9/02*
U.S. Cl. 73—398 **10 Claims**



An extremely sensitive differential pressure to current transducer employing:

(1) A unitary rigid disc and a thin pressure sensing membrane for the closed end portion of a bellows that has an open end mounted on a stationary wall;

(2) An overload valve to protect the membrane against rupture by the separate fluid pressures acting on the internal and external surface of the bellows; and wherein

(3) The overload valve is mounted for movement with the disc and into sealed engagement with one or the other of opposite sides wall surfaces of the stationary wall.

3,559,489

BAR STOCK ZERO ADJUSTMENT WITH STOP

Thomas A. S. Duff, Chalfont, and Ralph D. Waite, Sellersville, Pa., assignors to Amtek, Inc., New York, N.Y., a corporation of Delaware

Filed June 2, 1969, Ser. No. 829,259
Int. Cl. G01l *7/04*
U.S. Cl. 73—415 **8 Claims**

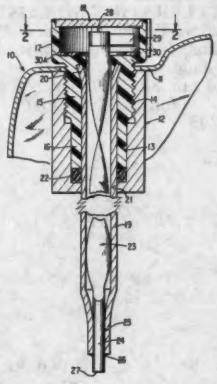
A Bourdon tube pressure gauge has its instrument movement mounted between a bottom and top plate with the latter being pivotally mounted on the socket of the gauge at a point spaced from the pointer axis. The top plate is provided with a slot extending radially from the pivotal connection. A pin is pivotally mounted in a bore in the socket and is provided with an eccentric which moves within the top plate slot so that actuation of the pin externally of the socket will adjust the movement while the free end of the Bourdon tube remains stationary.

3,559,490

PRESSURE GAUGE

Leonard J. Bohenek, Northampton, Pa., assignor to Ametek, Inc., New York, N.Y., a corporation of Delaware

Filed Apr. 18, 1969, Ser. No. 817,339
Int. Cl. G01l *19/16*
U.S. Cl. 73—418 **5 Claims**



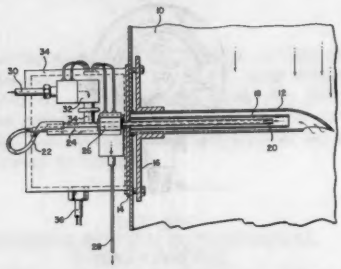
A gauge for measuring pressure within a receptacle having an elongated body for mounting on a receptacle wall and extending inside of the receptacle. A calibrated

twist tube anchored at its inner end to the elongated body carries an indicator at its outer end which turns with the tube in response to pressure changes in the receptacle. Coacting stationary indicia is provided for viewing at the outer end of the body.

3,559,491
GAS SAMPLING PROBE

Gerhardt N. Thoen, Kelso, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash., a corporation of Washington

Filed Mar. 10, 1969, Ser. No. 805,499
Int. Cl. G01n *1/24*
U.S. Cl. 73—421.5 **10 Claims**

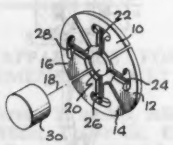


A gas sampling probe is disclosed for sampling particulate and moisture laden gases. The probe comprises a tubular shielding member having an open end in the gas flow path and a tubular sampling probe mounted concentrically within the shielding member. The sample probe is made of a low heat conductive substance permeable to moisture. Particularly useful are ceramic materials. The probe (1) allows moisture to evaporate through it into the atmosphere, (2) cools the gas sample without degradation thereof, and (3) is corrosion resistant. Particulate matter which deposits in the sampling probe is removed by periodically flushing the tubular probe with compressed air or other fluid. Valve means periodically and selectively connects the flushing fluid to the probe member.

3,559,492
TWO-AXES ANGULAR RATE AND LINEAR ACCELERATION MULTISENSOR

Harold F. Erdley, Pacific Palisades, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif., a corporation of Maryland

Filed Jan. 30, 1967, Ser. No. 612,401
Int. Cl. G01p *15/02*
U.S. Cl. 73—505 **19 Claims**

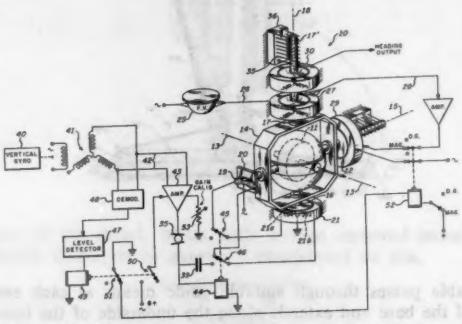


A vibratory member, supported by a torsion spring means whose axis of twist is perpendicular to the axis of spin of a supporting shaft, the undamped natural angular frequency of vibration of the vibratory member upon its supporting spring means being set equal to the angular frequency of rotation of the supporting shaft. The vibratory member is adapted to be set into vibration by acceleration or rotation of the instrument.

3,559,493
DIRECTIONAL GYRO TURN ERROR COMPENSATOR

William N. Brooks, Jr., and George R. Miller, Phoenix, Ariz., and Richard K. Radtke, Newbury Park, Calif., assignors to Sperry Rand Corporation, a corporation of Delaware

Filed Oct. 24, 1968, Ser. No. 770,313
Int. Cl. G01c *19/30*
U.S. Cl. 74—5.45 **5 Claims**

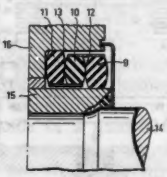


A directional gyro for aircraft in which inner gimbal precession due to frictional forces about the d.g. vertical ring support axis produced by slip rings and bearings during a turn are compensated by applying an equal and opposite torque about the vertical axis dependent upon craft bank angle exceeding a predetermined value in either direction whereby to prevent a residual azimuthal error from building up as a result of continuous banked turns in the same direction.

3,559,494
ARRANGEMENT FOR OBTAINING AN ABSOLUTE SEAL IN BEARINGS WHICH INCLUDE ANGULAR OSCILLATING MOVEMENTS

Bjarne Louis Petersen, Ronnvagen, Jarna, Sweden, assignor to Aktiebolaget Scania-Vabis, Sodertalje, Sweden, a corporation of Sweden

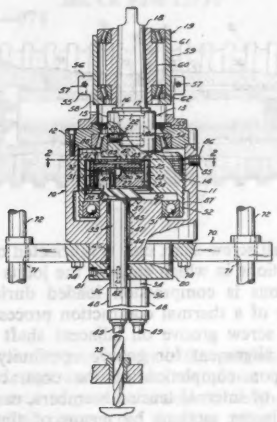
Filed Mar. 7, 1969, Ser. No. 805,316
Claims priority, application Sweden, Mar. 11, 1968, 3,175/68
Int. Cl. F16j *15/50*
U.S. Cl. 74—18 **1 Claim**



An arrangement for obtaining an absolute seal between an axle or axle unit and an inner cylindrical surface in a bore disposed in a bearing housing or the like coaxial with the axle, the axle or the like and the cylindrical surface being permitted to perform a limited relative angular oscillating movement. A resilient seal ring made of rubber or similar material which has a low modulus of elasticity is so secured under subjection to radial compression forces between said members that said ring as a result of its pretensioned state is held in

rotationally stationary abutment with respective abutment surfaces in bearing housing and on the axle unit. The seal ring, upon a predetermined limited relative angular movement of either member, will then completely take up said angular movement with a stretch.

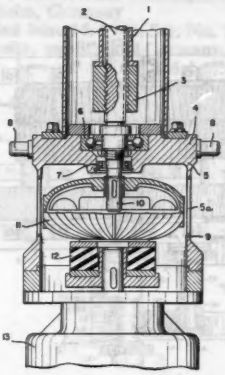
3,559,495
GEARLESS MULTIPLE SPINDLE DRIVE
Albert R. Ludwig, Cleveland, Ohio, assignor to Zagar, Inc., a corporation of Ohio
Filed Mar. 12, 1969, Ser. No. 806,400
Int. Cl. F16h *21/12*
U.S. Cl. 74—63 8 Claims



A gearless multiple spindle drive which includes a drive crank having a drive shank and a crank body is disclosed. The crank body is provided with an eccentric crank socket which is offset from the center of the drive shank to establish the throw of the drive crank. An oscillator plate is received in the socket for oscillatory rotation relative to the crank body and for non-rotative, circular, translatory motion relative to surrounding space. A plurality of driven cranks are drivingly engaged by the oscillator plate and have the same throw as the drive crank. The driven cranks have shanks which are carried by a housing. The housing is restrained against rotation. Bearings rotatably support the drive crank on the housing.

3,559,496
APPARATUS FOR TRANSFORMING ROTARY MOTION INTO LINEAR DISPLACEMENT AND INCLUDING A SLIP-TYPE COUPLING
Rudolf Betzing, Altendorf-Ulfkotte, Germany, assignor to AG Eisenhutte Prinz Rudolph, Dulmen, Westphalia, Germany, a German corporation
Filed July 26, 1968, Ser. No. 748,058
Claims priority, application Germany, July 26, 1967, P 15 83 123.9
Int. Cl. F16h *25/20*
U.S. Cl. 74—89.15 8 Claims

An apparatus for converting rotary movement from a prime mover such as a gasoline engine or an electric motor, to linear movement for displacing a load wherein a rotary screw member is mounted in a casing and is either an axially shiftable nut or a threaded spindle. The motor casing terminates in a projecting shaft. A tubular casing, with openings in the walls for the throughflow of air, is provided between the screw casing and the motor casing and is flanged to both to produce a housing separated from the screw and motor and receiving a slip-type coupling, the parts of which are connected to the shaft of the screw assembly and to the motor shaft. A bearing of the combined thrust and radial type is provided in the plate of the tubular housing between the



coupling and the screw assembly while a flexible coupling is provided in the housing space between the coupling and the motor shaft. The coupling body is provided with air-displacing elements.

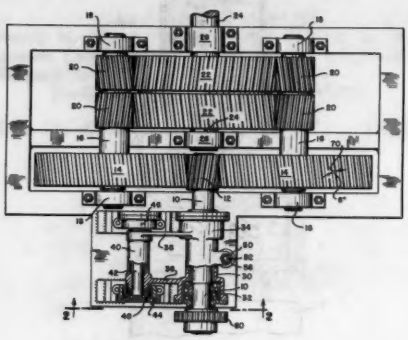
3,559,497
PAWL AND RATCHET MECHANISM
Emiel-Maria Steenackers, Willebroek, Pieter van den Eynden, Ranst, and Remy Felix Ruelens, Edegem, Belgium, assignors to International Standard Electric Corporation, New York, N.Y., a corporation of Delaware
Filed Nov. 1, 1968, Ser. No. 772,708
Claims priority, application Netherlands, Nov. 3, 1967, 6714953
Int. Cl. F16h *31/00*
U.S. Cl. 74—143 5 Claims

A stepping mechanism is provided using a rotatable star wheel formed of plastic and a fork-shaped pawl. The arms of the pawl are terminated in two surfaces, one of which has about half the area of a tooth on the star wheel. The relatively small area on the pawl is chosen so that it cannot cause the star wheel to rotate in the backward direction even when it becomes sticky due to the presence of grease on it.

3,559,498
FLOATING PINION MOUNTING FOR REDUCTION GEAR UNITS
John Narsted, Hampstead, Montreal, Quebec, Canada, assignor to Kennedy Van Saun Corporation, Danville, Pa., a corporation of Delaware
Filed Mar. 26, 1969, Ser. No. 810,682
Int. Cl. F16h *57/00*
U.S. Cl. 74—410 8 Claims

Mechanism for floating a high speed input shaft carrying a pinion for simultaneously driving a pair of similar gears, comprising a guiding mechanism floating the input

shaft and pinion for small up and down movements, including a radius arm structure having a pair of spaced bearings on the shaft, the radius arm being pivoted



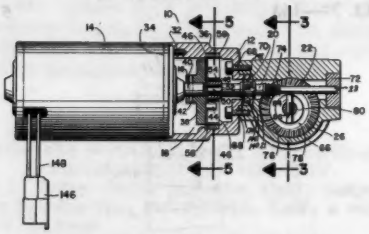
laterally of the shaft on a pivot axis parallel to the shaft, and means for counterbalancing the weight of the shaft and pinion.

3,559,499

SELF-CONTAINED MECHANICAL ACTUATOR

Anthony G. Profet, Charlotte, N.C., assignor to Duff-Norton Company, Inc., Charlotte, N.C., a corporation of North Carolina

Filed Sept. 15, 1969, Ser. No. 857,911
Int. Cl. F16h *1/18, 57/00*
U.S. Cl. 74—424.8 **11 Claims**



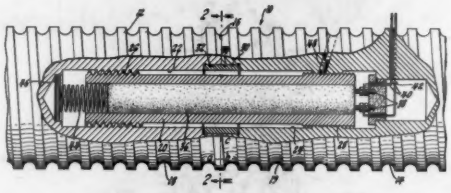
A self-contained mechanical actuator of the jackscrew-type that includes a drive motor secured to a housing with a drive shaft projecting from the motor into the housing for driving a high-efficiency skew-axis, screw-type gear set to which is connected a screw member having a double helix screw thread formed at a high helix angle for high-efficiency manipulation of a load-attached travelling nut member. The gear set includes a pinion shaft carrying a pinion that has worm-like screw teeth, and a gear with teeth formed on a generally radial face for multiple tooth, face-meshing engagement with the pinion teeth. The pinion shaft is coaxially aligned with the drive shaft along an axis compactly disposed proximate the rotational axis of the gear and screw member. A self-locking transmission mechanism drivingly interconnects the drive shaft and the gear set pinion shaft for substantially drag-free transmission of rotation to the gear set and connected screw member while substantially preventing any overriding, reversing or rundown rotation independent of the rotation of the drive shaft by the motor. The pinion shaft and the screw member are supported in radial ball bearings for rotation and for transmitting axial thrust to the housing. Ends of the pinion shaft and screw member are radially journaled in the housing to form radial thrust transmitting bearing couples in cooperation with the respective radial ball bearings.

3,559,500

BALL SCREW SHAFT

David A. Galonska and Dan R. Rowland, Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed Oct. 16, 1969, Ser. No. 867,009
Int. Cl. B23p *11/02;* **F16h** *1/18*
U.S. Cl. 74—424.8 **3 Claims**



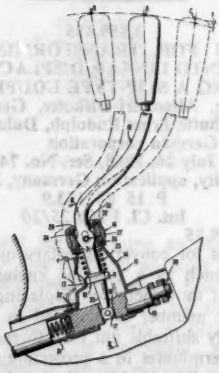
A long ball screw shaft unit is fabricated of a plurality of shaft sections in which each of the joints between adjacent sections is compression loaded during assembly through use of a thermal contraction process. The starts of the ball screw groove on adjacent shaft sections are ensured of alignment for groove continuity throughout the unit upon completion of the contraction process through use of internal tension members, each connected between adjacent sections by means of threads on opposite ends of the tension member formed with differing pitch.

3,559,501

SHIFTING BLOCKING MECHANISM FOR THE ENGAGEMENT OF THE REVERSE SPEED

Egon Wieland, Stuttgart-Feuerbach, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertürkheim, Germany

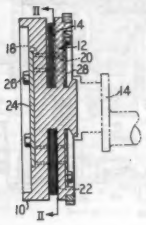
Filed Dec. 30, 1968, Ser. No. 787,904
Claims priority, application Germany, Dec. 30, 1967, P 16 30 407.7
Int. Cl. F16h *57/06;* **G05g** *9/02*
U.S. Cl. 74—476 **15 Claims**



A shift blocking mechanism for blocking the engagement of the reverse speed in a shifting mechanism for motor vehicle change-speed-transmissions, in which a

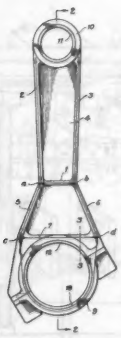
manual shifting lever is pivotably and axially displaceably supported in a bracket between its two ends and is additionally pivotably connected at its free end with another part of the shifting mechanism; the blocking action is obtained by the cooperation between a collar-like shoulder provided on the manual shifting lever intermediate the two pivotal connections and by a nose-like abutment formed by an indentation in the housing surrounding the manual shifting lever.

3,559,502
PENDULUM DAMPER
Fred R. Lofthouse, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill., a corporation of California
Filed July 24, 1969, Ser. No. 844,328
Int. Cl. F16f *15/10*
U.S. Cl. 74—574 **4 Claims**



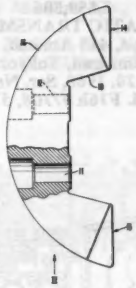
A pendulum damper in which the pendulum elements are made of separate modules or plates laminated in numbers required to produce a desired weight and damping effect and so constructed that the roller upon which the pendulums oscillate are readily interchangeable to provide a damper of similar basic design and size which might be tuned for various order of cyclic excitation.

3,559,503
CONNECTING ROD FOR HIGH POWER PISTON ENGINES
Ludwig Elsbett, Industriestrasse 14, Hilpoltstein, near Nuremberg, Germany
Filed Jan. 27, 1969, Ser. No. 794,140
Int. Cl. F16c *7/02*
U.S. Cl. 74—579 **4 Claims**



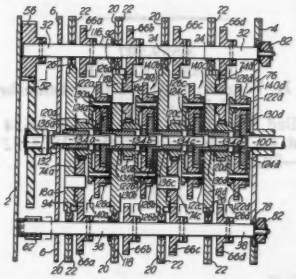
The connecting rod of I-beam section has two struts across the web and connecting the flanges. The flanges extend in straight lines between the struts and the ends of the rod to form a lightweight rod which is sufficiently rigid.

3,559,504
COUNTER-WEIGHTS FOR A CRANKSHAFT
Herbert Deutschmann, Stuttgart-Bad Cannstatt, Jürgen Wahnschaffe, Stuttgart-Stammheim, and Wolfgang Rudert, Grunbach, Kreis Waiblingen, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed June 14, 1968, Ser. No. 737,233
Claims priority, application Germany, June 15, 1967, P 15 75 426.4
Int. Cl. F16f *15/00*
U.S. Cl. 74—603 **6 Claims**



A counter-weight for crankshafts in which the part of the counter-weight that normally is immersed in the lubricant sump is constructed as a displacement body with low flow resistance to liquid.

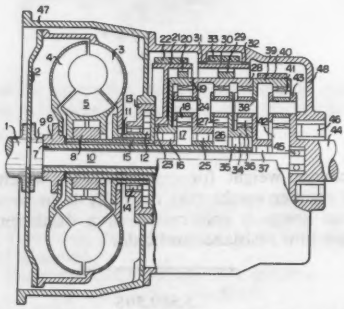
3,559,505
QUICK CHANGE VARIATOR
Lawrence Dilger, Cherry Hill, 31 Croham Mount, South Croydon, Surrey, England
Filed June 25, 1969, Ser. No. 836,330
Claims priority, application Great Britain, June 27, 1968, 30,713/68
Int. Cl. F16h *37/06*
U.S. Cl. 74—681 **23 Claims**



A quick change variator has a ring of spindles carrying gears surrounding and selectively connectable to each stage of a multistage summing assembly comprising a first stage of step down gearing and subsequent summing differential stages each having the same step down ratio, the selective connections from the spindles being made by transfer gears eccentrically carried by selector plates associated with each stage and mutually connected by mechanical counter type stepping mechanisms again having the same step down ratio therebetween. The spindles are equiangularly spaced with respect to each other and to

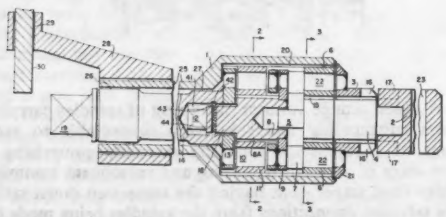
means operative to lock the transfer gears against rotation, and are one less in number than the step down ratio used between the summing assembly stages, this latter being 4, 5 or 6 and the number of stages being 3, 4, 5 or 6. The drive to the spindles is such that they will drive the transfer gears according to the angular position of the latter, at speeds in successive integral ratios increasing from unity. Means may be provided to prevent jamming between the gears on the spindles and the transfer gears during movement of the selector plates.

3,559,506
AUTOMATIC TRANSMISSION
Takuzo Tsuruya, 413 Amema, Akita-machi, Nishi-tama-gun, Tokyo, Japan
Filed Aug. 20, 1968, Ser. No. 754,024
Int. Cl. F16h *47/08, 57/10*
U.S. Cl. 74—688 **2 Claims**



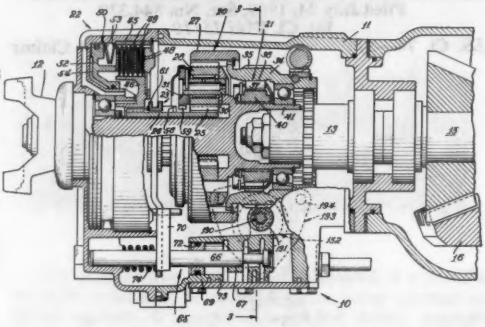
An automatic transmission is provided with a reduction gear mechanism or mechanisms mounted on a turbine shaft of a torque converter so that a large torque can be applied to an internal gear of a planetary gear mechanism therethrough even if the input applied to the torque converter is small in magnitude. The input applied to the sun gear of the planetary gear mechanism is large in magnitude, because the sum of said inputs is constant.

3,559,507
GEAR WRENCH
Paul H. Wagner, 5201 Winderscheiderbrol, Cologne, Germany
Filed Nov. 1, 1968, Ser. No. 772,634
Int. Cl. B25b *13/00*; F16h *1/28, 3/52*
U.S. Cl. 74—801 **9 Claims**



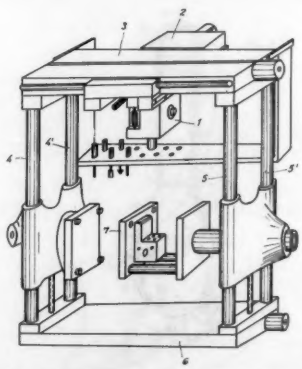
A force multiplication wrench is provided in the form of a casing having a longitudinal input shaft at one end and a longitudinal output shaft at the other end. A transmission, such as a planetary gear unit, is disposed in the housing connecting the two shafts. Tandem planetary gear units may also be used for greater force multiplication. In the case of planetary gears, the inner wall of the housing is adapted as the ring gear.

3,559,508
OVERDRIVE TRANSMISSION
Donald W. Kelbel, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill., a corporation of Delaware
Filed Jan. 6, 1969, Ser. No. 789,339
Int. Cl. B60k *21/10*; F16h *3/44, 5/42*
U.S. Cl. 74—864 **13 Claims**



A self-contained vehicle overdrive transmission for mounting adjacent the differential mechanism including a hydraulic control system providing selective or full automatic change from lockup condition to overdrive and vice versa under full power conditions.

3,559,509
MOVEMENT BRAKING MEANS FOR A DEVICE OPERATING ON WORKPIECES
Hellmut Müller, 731 Esslinger Strasse 91, Plochingen (Neckar), Germany
Filed Mar. 18, 1968, Ser. No. 713,909
Claims priority, application Germany, Sept. 15, 1967, M 75,551
Int. Cl. B23b *39/00*
U.S. Cl. 77—1 **9 Claims**



A tool is mounted on a frame for movement with respect to a workpiece cleared by the frame along axes perpendicular to each other. The frame carries thin plates which extend between a cylinder part of the tool carrier

and a clamping member connected to a piston slidable in the cylinder part. Spring means act in one direction on the piston while a pressure fluid acts in the other direction. The clamp part is formed of spring band steel.

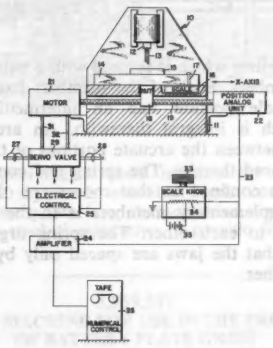
Means are provided to cause movement of the piston to clamp the band steel part when the tool reaches its desired working position.

3,559,510

NUMERICALLY CONTROLLED MACHINE TOOL WITH MANUAL MEANS FOR FINE ADJUSTMENT

Alfred T. Blackburn, West Boylston, Mass., assignor to The Heald Machine Company, Worcester, Mass., a corporation of Massachusetts

Filed Sept. 20, 1968, Ser. No. 761,078
Int. Cl. B23b *39/06*
U.S. Cl. 77—5 3 Claims



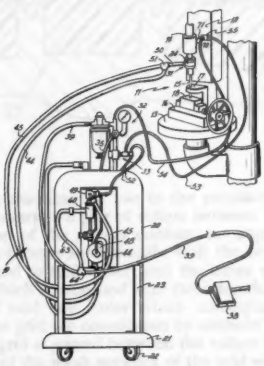
The invention relates to a machine tool having numerically-controlled positioning of the workpiece relative to the spindle and a manual means for use on occasion to obtain a more precise positioning than can be obtained by the numerically-controlled positioning system.

3,559,511

DRILL COOLANT METHOD AND APPARATUS

John P. Schaefer, Edwardsburg, and Robert J. Green, Niles, Mich., assignors to The Wheelabrator Corporation, Mishawaka, Ind., a corporation of Delaware

Filed June 3, 1969, Ser. No. 829,975
Int. Cl. B23b *35/00, 51/06*
U.S. Cl. 77—5 18 Claims



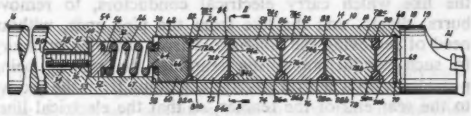
A method and apparatus for supplying coolant to an oil hole or oil tube drill or cutting tool. The method comprises the steps of supplying a liquid-air mist coolant to the drill or tool until it partially enters a workpiece and thereafter supplying liquid coolant, preferably under pulsating pressure, to the drill until it reaches full hole depth. Thereafter the liquid-air mist is supplied to the drill while it is withdrawn from the hole. The apparatus of this invention accomplishes these method steps automatically.

3,559,512

SERIES VIBRATION DAMPER

Trilok C. Aggarwal, Cincinnati, Ohio, assignor to The Cincinnati Milling Machine Co., Cincinnati, Ohio, a corporation of Ohio

Filed June 27, 1969, Ser. No. 837,191
Int. Cl. B23b *29/03*
U.S. Cl. 77—58 11 Claims



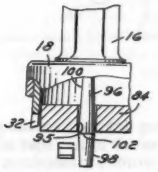
A series vibration damper unit for a variable natural frequency machine tool member wherein a series or several tandem sets of individual dampers, each comprising a damping mass effectively supported by two viscoelastic absorber elements, are arranged so that there is effective damping of said member over the usable frequency range of said variable natural frequency member.

3,559,513

HOLE SAW

Everett D. Hougen, G–5072 Corunna Road, Flushing, Mich. 48504

Filed May 6, 1968, Ser. No. 726,855
Int. Cl. B23b *51/04;* B23d *61/00*
U.S. Cl. 77—69 15 Claims



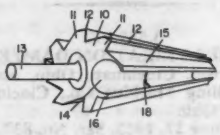
A hole saw in the form of an arbor having a cup member secured to one end thereof and a circular saw blade press fitted into the cup so that the blade flares outwardly in the direction of its cutting edge. The hole saw also includes a center pilot or drill member which may be a conventional drill, a piercing tool or a tapered pilot member. The teeth on the blade are ground so that the cutting edges are high around the outer periphery and low around the inner periphery of the blade. Selected teeth around less than half of the circumference of the blade are set radially inwardly a slight extent.

3,559,514

REAMERS FOR ELECTRICAL LINE CONDUITS, AND THE LIKE

Russell Brownfield, 6126 S. Langley Ave., Chicago, Ill. 60637

Filed June 17, 1968, Ser. No. 737,634
Int. Cl. B23d 77/12
U.S. Cl. 77—73 2 Claims



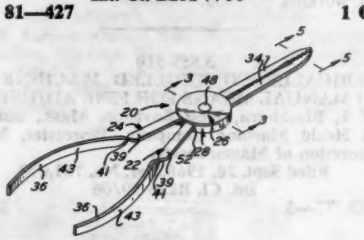
A reamer for reaming the ends of pipes, conduits, and the like which carry electrical conductors, to remove burrs, slivers, and the like from the pipe ends, without need of removing the conductors from the pipe or injury to such conductors during reaming; the reamer being provided with a central passage extending from the groove to the rear end of the reamer, so that the electrical lines may be laid down into such groove and passage preparatory to the reaming operation, being accommodated within the groove and passage during the reaming operation, and so that the electrical lines may be removed from the groove and passage after conclusion of the reaming operation.

3,559,515

SELF GRIPPING NEEDLE-NOSE PLIER

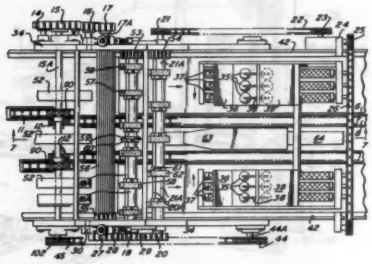
Smith Kyser, Ionia County, Mich., assignor to Aircraft Specialties, Inc., Lapeer, Mich., a corporation of Delaware

Filed Dec. 20, 1967, Ser. No. 692,092
Int. Cl. B25b 7/06
U.S. Cl. 81—427 1 Claim



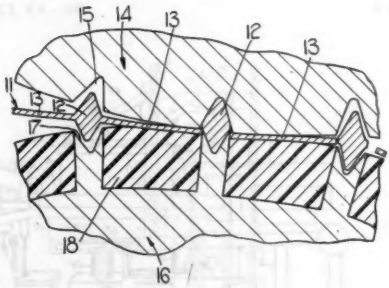
A pair of pliers which is formed with a pair of complementary members. Each of the members has a jaw portion, a handle portion and an intermediate arcuate portion which is integral therewith. An arcuate spring is provided between the arcuate portions of the members and is embraced thereby. The spring and complementary members are confined so that movement of the spring and the complementary members is in the same plane with respect to each other. The spring urges the jaws together so that the jaws are spaced only by urging the handles together.

3,559,516
TRIMMER AND STACKER
Edward J. Freeman, Springfield, Pa., assignor to Gaeco, Inc., North Wales, Pa., a corporation of Pennsylvania
Filed Nov. 5, 1968, Ser. No. 773,563
Int. Cl. B26d 7/06
U.S. Cl. 83—91 13 Claims



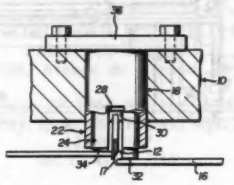
There is provided a book trimmer for continuously trimming and separating individual signatures in multiple signature printing, stacking the separated signatures, and trimming the stacked signatures to provide finished edges therefore.

3,559,517
FINISHING MACHINE FOR USE IN THE PRODUCTION OF BATTERY PLATE GRIDS
Dexter William Smith, and Alan Williams, Shirley, England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Jan. 22, 1969, Ser. No. 792,914
Claims priority, application Great Britain, Jan. 22, 1968, 3,217/68
Int. Cl. B26d 7/06
U.S. Cl. 83—117 1 Claim



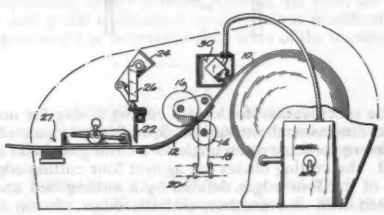
A finishing machine for use in the production of battery plate grids comprises a pair of rollers between which the grid is passed. One of the rollers contains an impression of the grid which conforms substantially with the face of the grid being presented to that roller, and the other roller contains projections which correspond with the interstices of the grid. The parts of said one roller which correspond to the interstices of the grid are constituted by resilient inserts so that in use as the grid is passed between the rollers the frame and the members of the mesh network of the grid will be received in the impressions of the grid in said one roller and the spaces between the projections of said other roller. The projections of said other roller will enter the interstices of the grid and in so doing will sever fillets of material closing the interstices from the frame and mesh network of the grid.

3,559,518
CUTTING DIE APPARATUS
Frank S. Domka, 26841 Kean, Inkster, Mich. 48141
Filed May 7, 1969, Ser. No. 822,356
Int. Cl. B26f 1/14; B26d 7/18
U.S. Cl. 83—124 3 Claims



Cutting die apparatus incorporating a series of individual stripper-ejector devices spaced along a steel rule-cutting die. These devices are operative both to strip the cut material from the die and eject the cutout portion.

3,559,519
AUTOMATIC DISPENSERS OF PRINTED GUMMED TAPE
Walter A. Westphal, Mequon, and George N. Baum, Milwaukee, Wis., assignors to Rexford Paper Company, Indianapolis, Ind., a corporation of Indiana. by mesne assignments
Filed Sept. 6, 1968, Ser. No. 757,934
Int. Cl. B26d 5/22, 5/32
U.S. Cl. 83—210 1 Claim

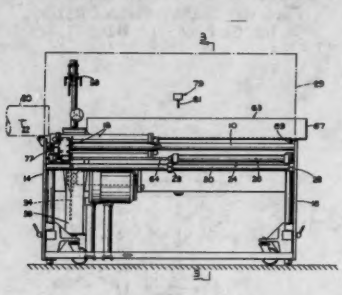


An automatic dispenser of printed gummed tape which includes a signal on the tape out of the area containing printed indicia. This signal motivates a control device which in turn stops the feeding of the tape and energizes a cutting device to cut the tape between each area of repetitious printed indicia with accurate indexing. No reliance is placed on measuring the length of section to be cut off by the rotation of tape feeding rolls.

3,559,520
SAWING AND OTHER LIKE CUTTING MACHINES FOR OPERATING ON MOVING BAR OR OTHER STOCK
John G. Postins, Wednesbury, and Stanley R. Prottey, Jubilee Estate, Cannock, England, assignors to Midland Industries Limited, Stafford, England, a British company
Filed Nov. 8, 1968, Ser. No. 774,275
Int. Cl. B23d 25/16
U.S. Cl. 83—292 10 Claims

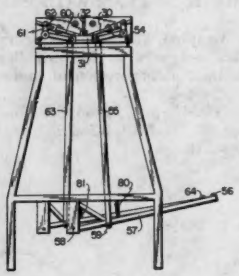
A flying saw machine having a control means for causing a main fluid pressure operated piston and cylinder device to advance substantially in unison with a carriage clamped to

and having a cutting tool to cut through the advancing bar stock and be withdrawn therefrom whereupon the clamps



release the carriage from the bar stock and said device returns the carriage and cutting tool to a starting position.

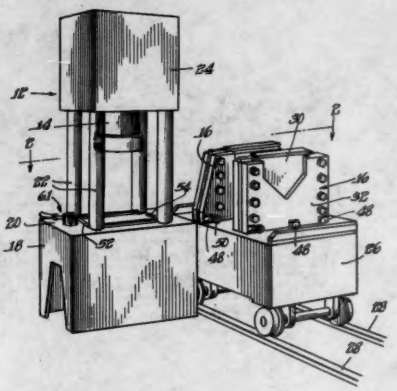
3,559,521
EXPANSION JOINT CUTTER
Elisha S. Kubala, R.R. 4, Box 218, Edmond, Okla.
Filed Feb. 19, 1969, Ser. No. 800,910
Int. Cl. B26d *3/14*
U.S. Cl. 83—440 **9 Claims**



The specification discloses a cutting device for notching a three dimensional workpiece. Specifically a pair of cutting blades reciprocate at an angle to a cutting bed and a cutting anvil. The cutting blades cut against four cutting edges, with two of the four edges defined by a cutting bed and axially aligned with one another, and the other two on the anvil disposed parallel to one another and perpendicular to the first two cutting edges.

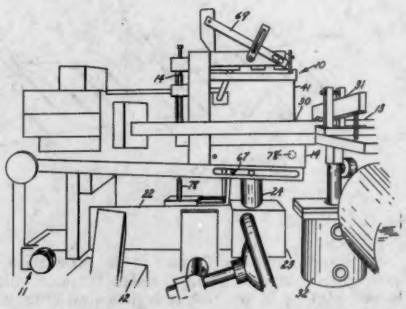
3,559,522
INTERCHANGEABLE DIE UNITS FOR HYDRAULIC PRESSES
Raymond L. Valente, Kankakee, Ill., assignor to Manco Manufacturing Co., Bradley, Ill., a corporation of Illinois
Filed Jan. 28, 1969, Ser. No. 794,582
Int. Cl. B26d *5/02*
U.S. Cl. 83—571 **11 Claims**

Apparatus of the type which includes a frame having a base portion with a support surface, a ram reciprocably mounted to said frame for movement toward and away from said support surface of the base portion, and a die unit removably positioned on said supporting surface. The die unit is comprised of an anvil arrangement and a blade element slidably and telescopically associated with said anvil arrangement to cooperate therewith for the processing of a workpiece. The die unit is constructed so that the blade element may be releasably connected to said ram whereby interchangeability thereof is attained. In addition, there are provided means to facilitate the proper positioning of said die unit with respect to said ram. Said alignment means include protruding means provided on the underside of said anvil arrangement adapted to cooperate with correspondingly shaped recess means formed in the support surface of said base portion. The recess means are designed to receive said



protruding means and thereby properly to position said die unit with respect to said ram along a first axis of alignment. Said alignment means further include additional means to attain proper positioning along a second axis of alignment.

3,559,523
RECIPROCATING BLADE SAW HAVING BLADE-TENSIONING MEANS RESPONSIVE TO DIRECTION OF MOVEMENT
Paul Karlan, New York, N.Y. (620 Ogden Ave., Mamaroneck, N.Y. 10543)
Filed May 26, 1969, Ser. No. 827,805
Int. Cl. B26d *5/08*
U.S. Cl. 83—647 **5 Claims**



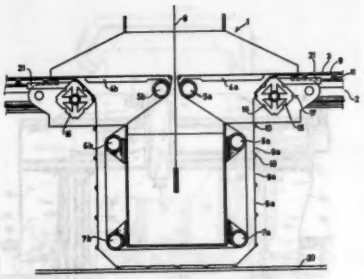
A reciprocating flexible blade-type saw in which the blade is carried by a C-shaped frame. Means is provided for varying the tension placed upon the blade, so that the blade is under greater tension during a cutting stroke than a return or idle stroke.

3,559,524

DEVICE FOR CUTTING LAMINATED MATERIAL

Hendrik Glastra, Enschede, Netherlands, assignor to N. V. Maatschappij voor Industriele Research en Ontwikkeling, Enschede, Netherlands

Filed Apr. 30, 1969, Ser. No. 820,505
Claims priority, application Netherlands, May 10, 1968, 6806654
Int. Cl. B26d 7/00
U.S. Cl. 83—648 4 Claims



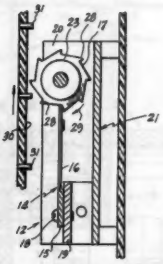
A device for cutting plate material, comprising a supporting face for the material constituted by a flexible belt guided about rollers which are supported by a carriage movable along a frame, together with a transverse slit, and the cutter, the flexible belt being supported by an articulated supporting table, which is constructed from a plurality of juxtaposed oblong plates the long sides of which are hingedly interconnected, while their ends bear on supporting members provided on the two longitudinal edges of the frame and movable into and out of the plane of the articulated supporting table, under the action of cams provided on the carriage.

3,559,525

STAR WHEEL MUSIC BOX

Harry Fishbein, 3725 Henry Hudson Parkway, New York, N.Y.

Continuation-in-part of application Ser. No. 697,421, Jan. 12, 1968. This application Oct. 8, 1969, Ser. No. 868,971
Int. Cl. G10f 1/06
U.S. Cl. 84—98 4 Claims



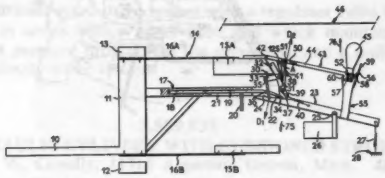
In a music box comprising a comb with fingers to vibrate at different audible frequencies when struck at their free ends by striking wheels each individually associated with a respective finger and having peripheral teeth to strike the respective finger when the wheel is angularly displaced independently of the other wheels about an axis of rotation which is directed laterally to the fingers adjacent their free ends, and a replaceable actuating member releasably mounted for movement of a surface thereof, from which projections extend, tangentially past the striking wheels so that the projections selectively engage teeth of the wheels to angularly displace the latter in a selected sequence and thereby cause striking of the fingers in such sequence for playing a melody to which the replaceable actuating member corresponds; spacing means independent of the striking wheels are provided between the wheels to isolate the rotational motion of each wheel from the adjacent wheels. These spacing means may be washers of a low friction synthetic plastic or projections formed integral with the base portion of the music box and extending upwardly therefrom.

3,559,526

MUSICAL INSTRUMENTS, ESPECIALLY OF THE PERCUSSION TYPE

Andre Raffali, 188, Avenue de Verdun, 36 Chateauroux, France

Filed Sept. 20, 1968, Ser. No. 761,099
Claims priority, application France, Sept. 25, 1967, 122,069/67
Int. Cl. G10c 3/16
U.S. Cl. 84—434 18 Claims



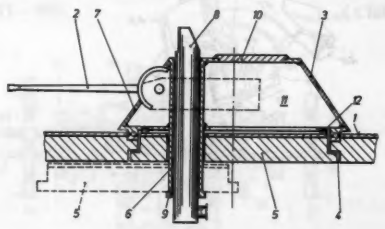
In application of the invention to a keyboard musical instrument such as a piano, the key is guided by a deformable parallelogram linkage, so that during its actuated displacement, the key remains parallel to its original orientation; between each key and the associated hammer is interposed a transmission which, when the key is depressed, gives the hammer an accelerated movement with respect to the movement of depression of the said key; the release of the transmission for the free return of the hammer after striking, is effected after the full depression of the key during the sole inertia movement of the hammer towards the wire; the effect of the soft pedal is obtained by continuous modification of the active length of an intermediate lever of the transmission.

3,559,527

ARMORED COMBAT VEHICLE

Hans-Georg Schallehn, Kassel, Germany, assignor to Rheinstahl Henschel A. G., Kassel, Germany, a corporation of Germany.

Filed Nov. 15, 1967, Ser. No. 683,320
Claims priority, application Germany, Dec. 9, 1966, R44761
Int. Cl. F41h 5/22
U.S. Cl. 89—36 9 Claims



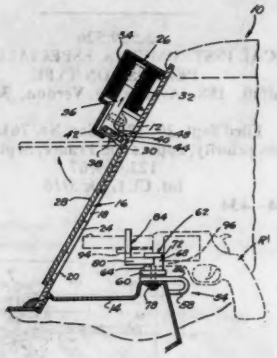
A combat vehicle comprises an armored hull protected against nuclear radiation, an armored turret mounted on the hull, an opening connecting the turret and the hull, and vertically movable, pivotal, closing means, protected against nuclear radiation, for closing the opening.

3,559,528

WEAPONS SYSTEM FOR MOTOR VEHICLES

Zed Cunningham, 4104 Green Court, Cleveland, Ohio

Filed Oct. 27, 1969, Ser. No. 869,809
Int. Cl. F41f *23/10*
U.S. Cl. 89—40 2 Claims



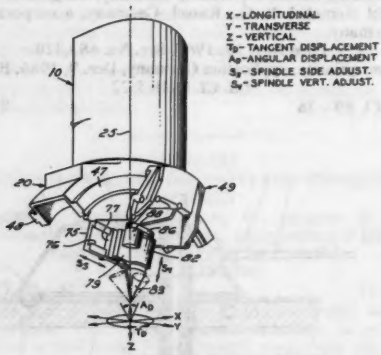
A weapon system for a motor vehicle in which a gun rest is pivotally mounted on the vehicle dash panel. The windshield of the vehicle has an opening therein, and a cover plate for the opening is movably mounted to provide a selective closure for the opening.

3,559,529

TWO-AXIS MACHINING HEAD FOR USE ON A THREE-AXIS MACHINE TO PROVIDE A CUTTING TOOL WITH A FIVE-AXIS MOVEMENT

Thomas D. Vertin, 37540 Lake Shore Road, Mount Clemens, Mich. 48043

Filed Nov. 12, 1968, Ser. No. 774,881
Int. Cl. B23c *1/16*
U.S. Cl. 90—13 5 Claims



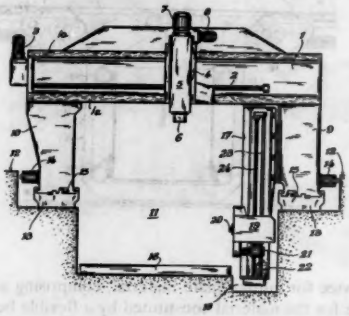
A two-axis machining head with tangent displacement and angular displacement for use on a three-axis machine to provide a five-axis controlled machine with seven movements of a cutting tool comprising, longitudinal, transverse, vertical, tangent displacement, angular displacement, spindle side adjustment, and spindle vertical adjustment movements.

3,559,530

PORTAL MILLING MACHINE

Hans O. Wagner, Dusseldorf-Lohausen, and Gert Traugott, Buderich, Germany, assignors to Schiess Aktiengesellschaft, Dusseldorf, Germany

Filed Nov. 22, 1968, Ser. No. 778,230
Claims priority, application Germany, Nov. 25, 1967, P1,627,119
Int. Cl. B23c *1/10*
U.S. Cl. 90—14 2 Claims



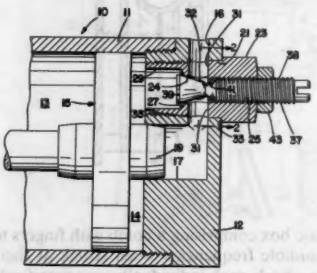
A portal milling machine for machining work pieces of considerable height and length, in which the transverse beam carrying carriage means movable in the longitudinal direction of said beam and transverse thereto is displaceable on supporting means arranged on opposite sides of and at a higher level than a chucking plate at the bottom of a longitudinal pit below said beam while at least one vertical arm connected to said beam extends downwardly into said pit and has displaceably mounted thereon an additional carriage with a substantially horizontal axially displaceable spindle.

3,559,531

SPEED CONTROL VALVE FOR A FLUID MOTOR

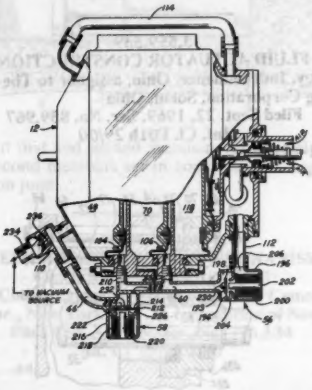
Kurt W. Leibfritz, Norridge, and Lester W. Malinowski, Mt. Prospect, Ill., assignors to Parker-Hannifin Corporation, Cleveland, Ohio, a corporation of Ohio

Filed July 15, 1968, Ser. No. 744,803
Int. Cl. F15b *15/22*; F16k *25/00*, *51/00*
U.S. Cl. 91—26 1 Claim



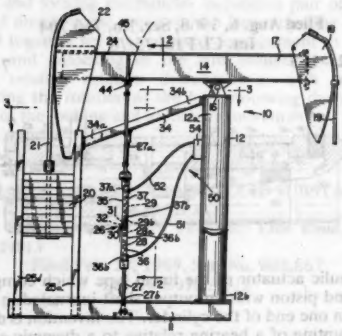
A speed control valve for a fluid motor of the piston and cylinder type in which the valve seat engageable by the head of the valve member is inwardly facing whereby the valve member cannot be removed from the valve in an outwardly direction.

3,559,532
TRAVEL SERVOMOTOR
Stanley I. MacDuff and Maxwell L. Cripe, 401 N. Bendix Drive, South Bend, Ind. 46620
Filed Oct. 23, 1968, Ser. No. 769,789
Int. Cl. F15b *7/08, 13/04, 13/14*
U.S. Cl. 91—33 6 Claims



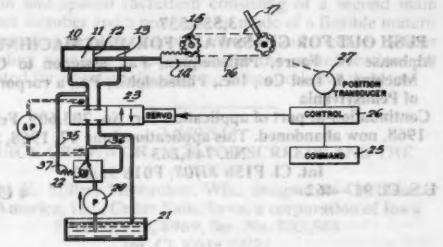
A servomotor for a power brake system which includes a pressure responsive wall in a chamber separated by a partition from the working chamber of the servomotor.

3,559,533
PUMPING APPARATUS
Gunter Maasshoff, Glenview, Ill., assignor to Hawk Oil Field Equipment Corp., Evanston, Ill., a corporation of Illinois
Filed Mar. 28, 1969, Ser. No. 811,400
Int. Cl. F01b *13/04*
U.S. Cl. 91—196 14 Claims



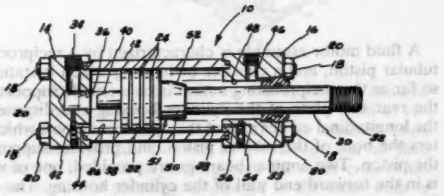
An improved hydraulic operating mechanism for rocking a beam of a pumping apparatus to reciprocate a well pump disposed in a well pipe and connected to the beam. The operating mechanism includes first and second generally stationary piston rods with first and second stationary pistons thereon, first and second cylinder sections positioned respectively for reciprocating movement relative to the first and second pistons, and means for delivering fluid under pressure to the cylinder sections to drive the cylinder sections relative to the generally stationary piston rods to reciprocate the well pump in such a way that the principal forces placed on the piston rods are tension forces.

3,559,534
HYDRAULIC ACTUATOR CONTROL CIRCUIT
Harrison Munro, Aurora, Ill., assignor to Pines Engineering Co., Inc., a corporation of California
Filed Apr. 23, 1968, Ser. No. 723,464
Int. Cl. F15b *9/03, 9/09*
U.S. Cl. 91—363 2 Claims



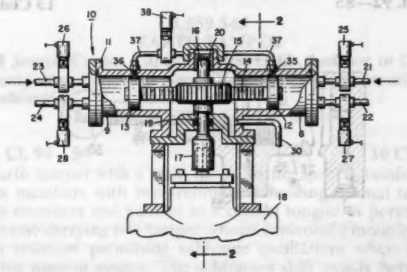
A hydraulic servo drive system with a regulator valve connected in series with a servovalve, and which maintains a constant pressure drop across the servovalve and a uniform drive velocity in the system.

3,559,535
HYDRAULIC CYLINDER WITH CUSHIONED STROKE
Patrick W. Conolly, 11712 Appleton, Detroit, Mich. 48239
Filed Jan. 21, 1969, Ser. No. 792,584
Int. Cl. F15b *15/22*
U.S. Cl. 91—396 6 Claims



A piston and cylinder hydraulic actuator having a cushioning valve carried by the piston which is received into the fluid discharge port as the piston approaches the end of its stroke. The valve is formed with a flat which progressively restricts fluid discharge to gradually decelerate the piston's velocity.

3,559,536
MULTIPOSITION SHAFT ACTUATOR
John P. Mason, Los Angeles County, Calif., assignor to Esso Production Research Company
Filed Sept. 11, 1968, Ser. No. 759,035
Int. Cl. F15b *11/08, 20/00*
U.S. Cl. 91—409 4 Claims



A fluid powered multiposition shaft actuator controlled by pilot valves. The actuator moves automatically to a chosen

position upon failure of control power to power-operated pilot valves. A housing containing a shaft forms two fluid-powered cylinders at each end thereof. A piston is arranged in each cylinder. These pistons are mechanically linked to each other and to the shaft for positioning the shaft. When the shaft is rotatable, the linear force of the pistons is converted to rotary force for rotating and positioning the shaft.

3,559,537

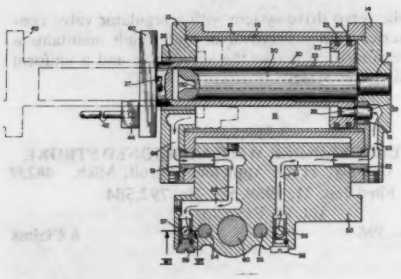
PUSH OUT FOR GLASSWARE FORMING MACHINERY

Alphonse W. Faure, Philadelphia, Pa., assignor to C.S.S. Machine & Tool Co., Inc., Philadelphia, Pa., a corporation of Pennsylvania

Continuation-in-part of application Ser. No. 703,609, Feb. 7, 1968, now abandoned. This application June 17, 1968, Ser. No. 744,263

Int. Cl. F15b *11/08;* **F01b** *31/00*

U.S. Cl. 91—462 **4 Claims**



A fluid motor assembly is characterized by a reciprocating tubular piston, and a cylinder or housing which is stationary so far as the reciprocating action is concerned. Supported in the rear end plate of the cylinder housing and disposed on the longitudinal center axis of the cylinder is a post which enters the bore of the tubular piston, and provides support for the piston. Two annular bearings are provided, one of which is in the forward end wall of the cylinder housing. The other bearing is between the interior surface of the piston, at the rear end, and the center post. The fluid motor is controlled by a reversible mounting plate and valve assembly which includes a pair of reversible valves and the necessary air ducts. The mounting plate and valve assembly is pivotal through 180° to change the positions of the pair of reversing valves to accommodate the fluid motor to either a right hand or left hand unit. Adjustment means are provided for adjusting the length of the piston stroke.

3,559,538

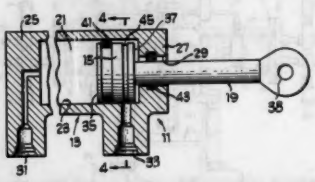
ACTUATOR

Robert E. Holder, Van Nuys, Calif., assignor to Borg-Warner Corporation, Chicago, Ill., a corporation of Delaware

Filed Dec. 23, 1968, Ser. No. 785,881

Int. Cl. F01b *11/02*

U.S. Cl. 92—85 **13 Claims**



A fluid operated piston-type actuator having a movable piston in an operating cylinder including means for deceleration of the piston upon reaching the limit of its stroke. The piston and operating cylinder cooperate to define a contracting deceleration chamber and a restricted orifice flow passage communicating between the deceleration chamber and the fluid discharge conduit. As the piston reaches the terminal portion of its stroke, the passage limits the rate of fluid discharge from the deceleration chamber to control the deceleration of the actuator. The deceleration means is arranged to insure consistent application of the established deceleration properties.

3,559,539

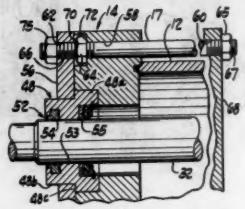
FLUID ACTUATOR CONSTRUCTION

Joseph Nagy, Independence, Ohio, assignor to The S-P Manufacturing Corporation, Solon, Ohio

Filed Sept. 22, 1969, Ser. No. 859,967

Int. Cl. F01b *29/00*

U.S. Cl. 92—128 **3 Claims**



A fluid actuator with improved end plate and tie rod construction to facilitate external removal of a rod bearing and rod seal cartridge. The cartridge is received in an external cavity in one end plate and is retained by a cover plate. The plates are secured by separate sets of nuts threaded on common tie rods that extend in nonthreaded engagement through aligned throughbores in the end plate and cover plate. The nuts that retain the end plate are recessed in counterbores in the end plate.

3,559,540

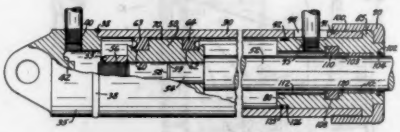
HYDRAULIC ACTUATOR

Arnold C. Sheldon, 1187 Raymond Ave., St. Paul, Minn. 55108

Filed Aug. 6, 1968, Ser. No. 750,704

Int. Cl. F16j *15/18*

U.S. Cl. 92—163 **7 Claims**



A hydraulic actuator of the lineal type which comprises a cylinder and piston with an output shaft journaled in a head mounted in one end of the cylinder. The invention is directed to the mounting of a bearing relative to a dynamic seal and wiper seal in the head or shaft guide closing the end of the cylinder and the location of the same relative to journaled surfaces on the piston together with an adjustable mounting of the head within the cylinder.

3,559,541

CONCRETE JOINT LOAD TRANSFER DEVICE

David Watstein, 10034 Renfrew Road, Silver Spring, Md. 20901

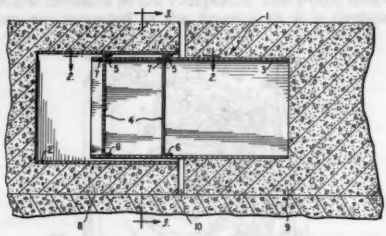
Filed July 8, 1969, Ser. No. 839,819

Int. Cl. E01c *11/10*

U.S. Cl. 94—8 **16 Claims**

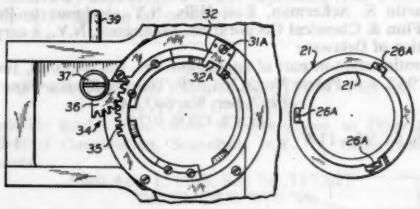
Disclosed herein is a concrete joint load transfer device including a first rectangular member, a second rectangular

member telescopically positioned within the first member and at least one suspension element connected to opposite



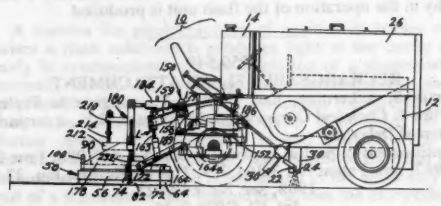
walls of said first and second members respectively, with the first and second members set in concrete slabs separated by an expansion joint.

3,559,542
QUICK RELEASE AND LOCKING MECHANISM FOR A CAMERA LENS MOUNTING
Hubert R. Clapp, Cresskill, N.J., assignor to Camera Service Center Inc., New York, N.Y., a corporation of New York
Filed Feb. 3, 1969, Ser. No. 796,134
Int. Cl. G03b *3/00*
U.S. Cl. 95—44 **12 Claims**



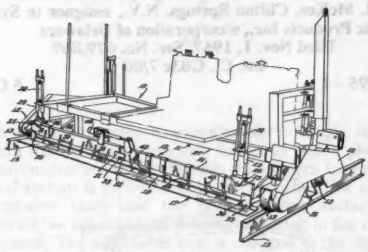
This disclosure is directed to a camera construction having a movable or interchange lens mounting provided with a quick lens release and locking mechanism. Essentially the release and locking mechanism includes a pair of coaxially disposed members for receiving the lens mounting which are coupled together for limited axial displacement to effect the locking and unlocking of the lens mounting by effecting limited relative rotation therebetween, with means for prohibiting the rotation of the lens mounting during the actuation of the locking and unlocking movement.

3,559,543
APPARATUS FOR APPLYING A FLUID SUBSTANCE TO A SURFACE
Richard Schwoebel, Jr., 169 Township Line Road, Chester, Pa. 19013
Filed Feb. 27, 1969, Ser. No. 802,867
Int. Cl. E01c *19/12*
U.S. Cl. 94—44 **8 Claims**



A spreader assembly adapted to be attached to a prime actuator for movement over a surface to uniformly spread a viscous material comprising an outer frame member of generally U-shaped configuration consisting of a center section and left and right-hand wing sections pivotally connected to opposite terminal ends of the center section, said frame member including a first main support member and a first strip made of a flexible material depending from the first main support member to provide a flexible edge in contact with the surface, a wiping bar generally parallel to the center section and spaced therefrom consisting of a second main support member and a second strip made of a flexible material depending from the support member and a center divider extending generally perpendicular to the center section and mounted for angular adjusting movement relative thereto.

3,559,544
QUICK CROWN CHANGE FOR SCREEDS AND THE LIKE
Harold E. Miller, Milwaukee, Wis., assignor to Curbmaster of America, Inc., Cedar Falls, Iowa, a corporation of Iowa
Filed Mar. 3, 1969, Ser. No. 803,568
Int. Cl. E01c *19/22*
U.S. Cl. 94—45 **10 Claims**

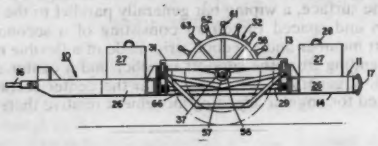


Crown control for screeds and the like in which a continuous screed bar is suspended from a beam in the form of two aligned beam sections spaced apart at their adjacent ends. The beam sections are pivoted to the screed bar at their outer ends by brackets depending from the outer ends of the beam sections, and pivotally connected to the outer ends of the screed bar for movement about axes extending transversely of the bar. Spaced links are pivotally connected between each beam section and the screed bar and extend angularly downwardly and outwardly from the respective beam sections. A guiding connection is provided between the beam sections, and guides the beam sections for angular movement about their axes of connection to opposite ends of the screed bar. A power jack is spaced above the beam and extends across the adjacent ends of the beam sections, and is connected thereto at its opposite ends. As the jack is extended, the beam sections will pivot upwardly about their axes of connection to the screed bar. This will draw the screed bar upwardly from its opposite ends through the connecting links and will draw the screed bar into a parabolic crown. Retractable movement of the power jack will align the beam sections and move the screed bar into a flat position.

3,559,545
EARTH TAMPER
Fred Joseph Caron, Citrus Heights, Calif., assignor to Caron Compactor Co., West Sacramento, Calif., a corporation of California
Filed July 24, 1969, Ser. No. 844,465
Int. Cl. E01c *19/24*
U.S. Cl. 94—50 **10 Claims**

Earth tamper with a main frame having spaced, reinforced cross members with two trunnions extending normal to the cross members and parallel to a central tongue. A perimeter subframe carrying two tamper wheels is pivotally mounted on each trunnion permitting subframe oscillations when compacting uneven grades. The subframes shift axially between the cross members and along the trunnions when travel direction is reversed placing in engagement alternate sets of force transfer members on main and subframe minimizing

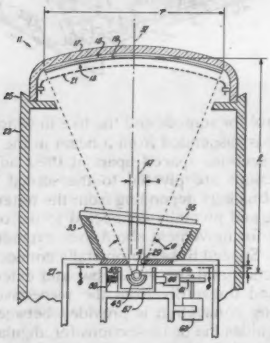
bending moments upon tamper wheel axles. Four, independently rotatable tamper wheels of spaced, open ring, spoked construction with sheepsfoot elements projecting outwardly from the ring facilitate short radius turning of the unit without disturbing compacted material. Nonengaging cleaner



bars are set on the subframe between adjacent wheel rings.

A second form of earth tamper includes only one perimeter subframe mounted upon a trunnion with main frame. Two, independently rotatable tamper wheels with cleaners are mounted on the subframe.

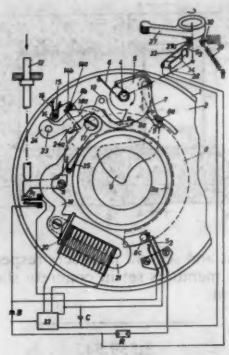
3,559,546
CATHODE RAY TUBE SCREEN EXPOSURE
Lefler H. McKee, Clifton Springs, N.Y., assignor to Sylvania Electric Products Inc., a corporation of Delaware
Filed Nov. 1, 1967, Ser. No. 679,869
Int. Cl. G03c *7/00*
U.S. Cl. 95—1 **5 Claims**



A method and optical system for light forming a cathode ray tube patterned screen utilizing unattenuated radiant energy of the light source. A photosensitive phosphor containing coating disposed on the screen panel is exposed, through an adjacently positioned mask, by radiant energy of substantially constant intensity from a substantially unattenuated direct light source oriented within an apertured light enclosure. Since the utilized area of the light source is smaller than the discrete aperture area, the light source is moved in a predetermined manner relative to the aperture to effect a simulated light source area equaling the aperture area.

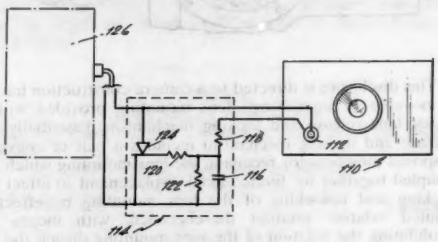
3,559,547
PHOTOGRAPHIC SHUTTER WITH RECIPROCATING SHUTTER BLADE DRIVING MEMBER AND ELECTRONIC TIMING DEVICE
Waldemar T. Rentschler, Calmbach, Germany, assignor to Prontor-Werk G.m.b.H., Calmbach, Germany
Filed Nov. 1, 1968, Ser. No. 772,571
Int. Cl. G03b *7/08*
U.S. Cl. 95—10 **3 Claims**

A photographic shutter having a driving member which when moved from a normal position opens and then closes the shutter by means of a reciprocating actuating member, an electronic timing device controls an armature lever biased by a return spring with the aid of a photoelectric resistor in dependence upon the ambient light. The armature lever cooperates with a pawl blocking the actuating member in the open position of the blades for the duration of the timing. A switch is connected in the circuit of the electronic timing



device and closes a contact when the cocking mechanism of the camera is actuated, the contact short circuiting the photoelectric resistor.

3,559,548
TIME-DELAY MEANS FOR RECHARGEABLE STROBOSCOPIC FLASH ATTACHMENT
Martin S. Ackerman, East Hills, N.Y., assignor to Perfect Film & Chemical Corporation, Manhasset, N.Y., a corporation of Delaware
Continuation-in-part of application Ser. No. 643,088, June 2, 1967, now Patent No. 3,364,829. This application June 19, 1967, Ser. No. 647,147
Int. Cl. G03b *9/70*
U.S. Cl. 95—11.5 **1 Claim**

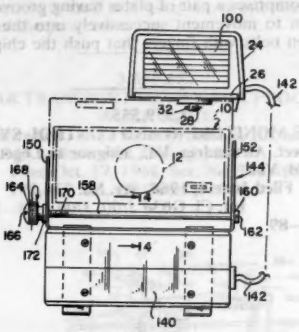


A rechargeable stroboscopic flash attachment adapted to be connected to a flashcube-receiving receptacle of a camera for actuating the shutter control mechanism. Contact members are also secured to the housing for engaging the electric contacts in the receptacle. An electronic time-delay for the circuit stroboscopic flashlamp effectively delays actuation of the flash unit so as to synchronize the flash unit with the timing induced by the shutter control mechanism. The time-delay circuit consists of a first resistor and capacitor connected in series, a second resistor shunted across the capacitor, and a third resistor connected between one terminal of the capacitor and a silicon control rectifier whereby a time delay in the operation of the flash unit is produced.

3,559,549
RECHARGEABLE FLASH ATTACHMENT
Martin S. Ackerman, East Hills, N.Y., assignor to Perfect Film & Chemical Corporation, Manhasset, N.Y., a corporation of Delaware
Continuation-in-part of application Ser. No. 643,088, June 2, 1967, now Patent No. 3,364,829. This application Jan. 22, 1968, Ser. No. 699,622
Int. Cl. G03b *9/70*
U.S. Cl. 95—11.5 **6 Claims**

A rechargeable stroboscopic flash attachment on a camera which includes a fitting rotatably mounted in a housing and

adapted to be diposed in a flash-cube-receiving receptacle of a camera for actuating the shutter control mechanism. Contact members are also secured to the housing for engaging the electric contacts in the receptacle. Electronic time-delay elements are mounted in the housing as is a stroboscopic



electronic lamp. The time-delay elements effectively delay actuation of the flash unit so as to synchronize the flash unit with the timing induced by the shutter control mechanism. The power pack for the flash attachment is suspended from the camera by clips secured to and depending from a bracket clampingly engaging the camera.

3,559,550
APPARATUS FOR TAKING PHOTOGRAPHS OF CAVITIES IN BODIES

Frank G. Back, Glen Cove, N.Y., assignor to Diversified Medical Corporation, Scarsdale, N.Y., by mesne assignments

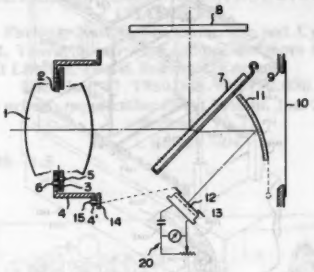
Filed Apr. 1, 1968, Ser. No. 717,827
Int. Cl. G03b *9/70*
U.S. Cl. 95—11.5 **5 Claims**

A camera for photographing of cavities in bodies comprises a flash tube which produces light in the cavity of a body in synchronism with the operation of a shutter which normally covers the diaphragm of a chamber for photographic film. The switch which completes the circuit of the flash tube comprises a contact which is mounted on the shutter release and engages a second contact when the shutter is in fully open position. The circuit of the flash tube includes a capacitor which is connected in the secondary circuit of a transformer and discharges across the electrodes of the flash tube when the switch is closed in response to opening of the shutter. The primary circuit of the transformer contains a variable resistor which is adjustable as a function of the type or speed of film that is being used in the chamber.

3,559,551
EXPOSURE METER FOR A SINGLE LENS REFLEX CAMERA HAVING INTERCHANGEABLE LENSES

Shigeo Ono, Yokohama-shi, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan, a corporation of Japan

Filed Apr. 2, 1968, Ser. No. 718,162
Claims priority, application Japan, Apr. 20, 1967, 42/24797;42/24798
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **7 Claims**



An exposure meter is provided for a single lens reflex camera having interchangeable lenses in which photometric measurements are made through the camera lenses. A relay optical system is provided between the objective secured to the camera body and the photosensitive surface of the photocell, an adjustable stop being provided in the relay optical system. The adjustable stop is coupled to the stop adjusting mechanism of the particular objective mounted on the camera to provide for the exposure meter a suitable sensitivity relative to the aperture ratio of the objective without varying the area to be measured.

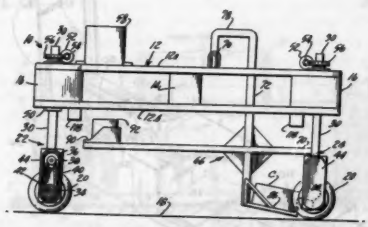
ERRATUM

For Class 95—44 see:
Patent No. 3,559,542

3,559,552
CAMERA CARRIAGE

Meyer Weitzel, 1616 Jessamine Ave., Orlando, Fla. 32806

Filed Mar. 10, 1969, Ser. No. 805,770
Int. Cl. G03b *17/56*
U.S. Cl. 95—86 **6 Claims**



A television camera carriage comprising a horizontal platform supported by four dirigible wheels on struts which may be selectively raised to provide a clear view for a camera pivotally supported beneath the platform, counterweight means being operative by movement of the camera to shift the center of gravity of the carriage so as to be stable irrespective of which of several struts is raised.

3,559,553

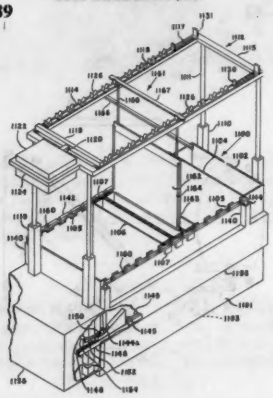
AUTOMATIC FORWARDING MECHANISM FOR PHOTOGRAPHIC MATERIALS

Werner W. Buechner, 4407 Gladding Court, Midland, Mich. 48640

Continuation-in-part of Ser. No. 342,029, Feb. 3, 1964, Ser. No. 342,459, Feb. 4, 1964, and Ser. No. 350,612, Mar. 9, 1964. This application Oct. 23, 1967, Ser. No. 684,582

Int. Cl. G03d *3/08*

U.S. Cl. 95—89 **13 Claims**



A device for automatic forwarding of photographic material from one treating station to the next. The forwarding device includes a base frame, a forwarding bar member movably supported in the base frame, lifting elements for raising and lowering the base frame, and a first actuating mechanism for horizontally reciprocating the forwarding bar member in the base frame. The forwarding bar member has seating elements thereon for supporting a film carrier when the base frame is in the raised position and for subsequently transferring the carrier to an adjacent processing tank. The device has separate seating elements for supporting the film carrier when the base frame is in its lowered position. In another embodiment, the forwarding device has a second actuating mechanism for reciprocating the forwarding bar member in a direction perpendicular to the direction of movement of the first actuating mechanism.

3,559,554

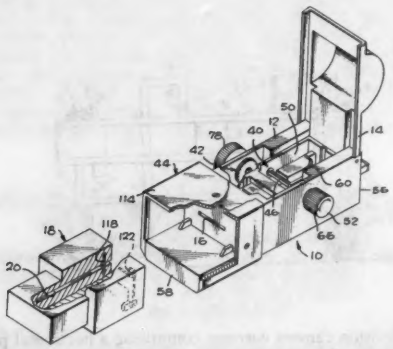
CHIP FILM PROCESSOR

Gunter Schmidt, Marina Del Rey, Calif., assignor to Productron, Inc., Los Angeles, Calif., a corporation of California

Filed May 27, 1968, Ser. No. 732,186

Int. Cl. G03d *3/08*

U.S. Cl. 95—89 **6 Claims**



Apparatus for processing packaged dental film chips without a darkroom comprising a daylight loader for stripping the coverings from a film chip and inserting the chip into a light-tight magazine, and a developer for receiving the magazine and moving the film chip therefrom through the processing solutions. The daylight loader comprises a hub that engages a tab on the film chip package to peel off an outer layer, and an assembly that holds another protective layer of the package away from the film chip while a roller moves the chip toward a slot that leads to the magazine. The developer comprises a pair of plates having grooves that confine the film to movement successively into the tanks, and motor driven belts with fingers that push the chip along the grooves.

3,559,555

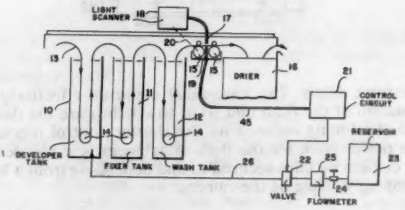
IMAGE MONITORING AND CONTROL SYSTEM

John N. Street, Alexandria, Va., assignor to Logetronics Inc., Springfield, Va.

Filed June 4, 1968, Ser. No. 734,297

Int. Cl. G03d *3/00, 3/06*

U.S. Cl. 95—89 **14 Claims**



A system is provided for automatically controlling chemical replenishment in a chemical-containing automatic film processor. As sheets of varying density image bearing material are transported through the processor, the varying density images in each of said sheets are optically monitored throughout substantially the entire width and length of each sheet. Information is stored relating to the aggregate image density in the monitored sheets; and a preselected quantity of replenishment chemical is supplied to the processor when the aggregate image density reaches a predetermined value.

3,559,556

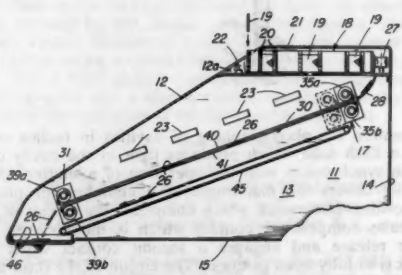
DENTAL X-RAY FILM PROCESSOR AND PROCESSING CASSETTE

Joseph V. McCarthy, Needham, Mass., John R. Manhardt, Nashua, N.H., and Robert W. Willis, Bedford, Mass., assignors to Itek Corporation, Lexington, Mass., a corporation of Delaware

Filed July 29, 1968, Ser. No. 748,442

Int. Cl. G03d *9/00*

U.S. Cl. 95—89 **19 Claims**



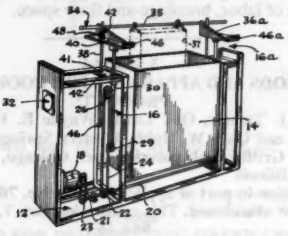
A dental X-ray film processor for automatically processing one or more X-ray film segments. The processor is adapted to sequentially strip the film, process the film through a

monobath processing cassette and deliver the developed film in one automatic operation. The processing cassette includes a plurality of coacting webs impregnated with the monobath processing solution which is adapted to develop the X-ray film on surface contact. The cassette consists of first and second mounting members which contain the supply rolls and takeup rolls of the coacting webs and are moved in a linear direction toward and away from one another during operation of the processor.

3,559,557
MODULAR TRANSPORT DEVICE FOR PROCESSING A WORK PIECE

Albert L. Schwartz, 4741 Keeney, Skokie, Ill., and Joseph G. Smajo, 1249 Ardmore St., Chicago, Ill.

Filed Oct. 17, 1966, Ser. No. 590,455
Int. Cl. G03d *3/10*
U.S. Cl. 95—89 **12 Claims**

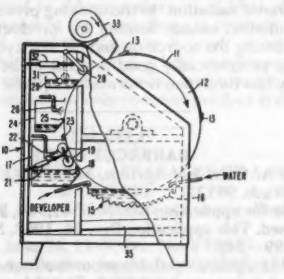


A photographic processor having removable modular devices for transporting the film through the processor. The modular device includes a pair of spaced cam members for supporting a work holder-carrying photographic film, lifting rods for each of the cam members, and releasable stop elements for each of the cam members. The releasable stop elements maintain the work holder in a first position on the cam member when the member is in the lowered position and release the work holder in response to raising of the cam member to permit it to move along the cam member to a transfer position in which the holder overlaps and is subsequently transferred to the first position on the cam members of the modular device contained in an adjacent processing tank. The modular device also has a control mechanism for selectively controlling the time periods which transpire between raising and lowering of the cam members.

3,559,558
ROTARY PROCESSING APPARATUS FOR PHOTOLITHOGRAPHIC PLATES

James S. Hamlin, Cherry Hill, N.J., and Walter G. Neuman, Southampton, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Filed Aug. 29, 1968, Ser. No. 756,245
Int. Cl. G03d *3/08*
U.S. Cl. 95—93 **8 Claims**

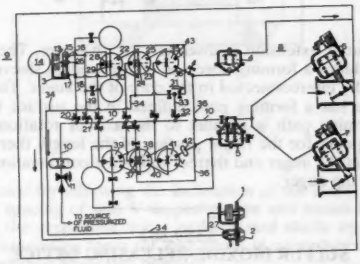


An automatic rotary-processing apparatus for photolithographic plates having a magnetic drum on which the plate is fastened while it is processed. The apparatus contains a developer tray, a rinse chamber incorporating a squeegee, pressure-scrubbing rolls, washing sprays, a treatment chamber having sprays, and a squeegee. The apparatus may also include a drying member for the processed plate. The plate is automatically moved in sequence through the developing tray, rinse chamber, treatment chamber, and past the squeegee and drying member. Mechanism are provided for controlling the operation of the squeegees, scrubbing rolls, and sprays.

3,559,559
FLUIDIC PRESSURIZATION CONTROL SYSTEM FOR CHAMBERS

Owen D. Furlong, East Coker, Somerset, and Cyril Thomas Priscott, Yeovil, Somerset, England, assignors to Westland Aircraft Limited, Yeovil, Somerset, England

Filed Jan. 17, 1969, Ser. No. 792,058
Claims priority, application Great Britain, Jan. 25, 1968, 3849/68
Int. Cl. B64d *13/04*
U.S. Cl. 98—1.5 **15 Claims**

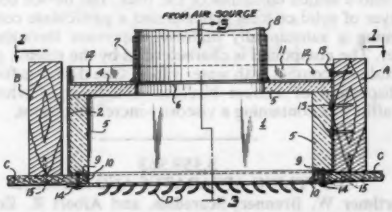


A fluidic pressure control system includes a capsule which is externally sensitive to direct environmental changes within a space such as an airplane cabin and internally sensitive to preselectively controlled environmental changes, a mass balanced beam pivotable responsive to expansion and contraction of the capsule, and a pair of fluid-actuated valves controlled by movement of the beam. The valves are connected to first and second control nozzles of a fluid amplifier and the output of the valves is used in controlling the pressure within the environmental space.

3,559,560
CEILING BOXES FOR DISTRIBUTING AIR

William R. Trahan, Houston, Tex., assignor to Texfan, Inc., Houston, Tex., a corporation of Texas

Filed Nov. 7, 1968, Ser. No. 774,077
Int. Cl. F24t *7/00*
U.S. Cl. 48—40 **3 Claims**



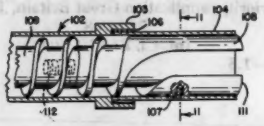
The invention is directed to ceiling boxes used to distribute air down through the ceiling of a room from a suitable furnace or cooler. The improved box is of rectangular form and is so constructed that it may be installed between the ceiling joists in a position with its length extending either parallel with or transversely of said joists, as desired. To achieve this

the box is adapted to be supported on one joist only, and is secured to this joist by means of fastening devices passing through either an end wall or a sidewall of the box. The open lower side of the box is covered by a suitable grille through which the air is discharged.

3,559,561
AUGER OUTLET EXTENSION

John A. Page, Minneapolis, Minn., and Robert C. Dechaine, Minneapolis, Minn., assignors to General Mills, Inc., a corporation of Delaware

Original application July 7, 1964, Ser. No. 380,890, now Patent No. 3,498,793, dated Mar. 3, 1970. Divided and this application Aug. 18, 1969, Ser. No. 850,777
Int. Cl. A47j *36/14*
U.S. Cl. 99—234 **2 Claims**

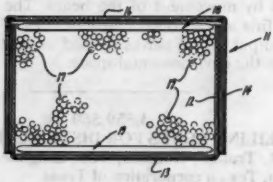


An outlet extension is disclosed for an auger. The extension includes a forming core and a surrounding sleeve which are rigidly interconnected to the core of the auger. The forming core has a forming path defined in the surface thereof. The forming path is parallel to the axis of rotation of the forming core for the major portion of the length thereof and curved at the auger end thereof to form a continuation of the helix of the auger.

3,559,562
SULFUR DIOXIDE-RELEASING DEVICE

Herbert E. Carlson, Fort Bragg, N.C., and Rodrick E. Black, Willits, Calif., assignors to Boise Cascade Corporation, Boise, Idaho, a corporation of Delaware

Filed June 6, 1969, Ser. No. 831,181
Int. Cl. A23b *7/00*
U.S. Cl. 99—239 **15 Claims**



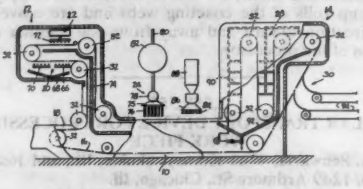
A device for preserving fresh fruit by releasing sulfur dioxide into a sealed container of the fruit. The device comprises a layer of solid coating material and a particulate compound forming a substantially uniform dispersion throughout the layer. The compound is characterized by the release of sulfur dioxide on contact with water vapor. One device is formed of a dispersion of sodium bisulfite in a layer of white scale paraffin wax containing a viscosity-increasing agent.

3,559,563
BOTTLING APPARATUS AND METHOD

Mortimer W. Brenner, Scarsdale, and Albert R. Erda, Armonk, N.Y., assignors to Glass Container Manufacturers Institute, Inc., New York, N.Y., a corporation of Ohio

Filed May 15, 1968, Ser. No. 729,319
Int. Cl. B67c *7/00*; B65b *55/06*, *63/08*
U.S. Cl. 99—275 **18 Claims**

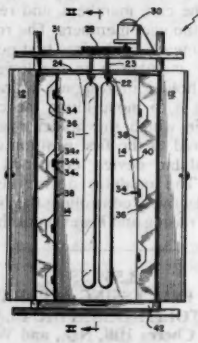
A bottling apparatus is disclosed wherein bottles disposed in rows of bottle-receiving pockets in an intermittently driven conveyor are passed through cleaning, charging, filling, sealing and warming or pasteurizing stations, wherein a predetermined number of rows of pockets are held stationary in each station during the processing thereof. The apparatus is capable of processing bottles at a high rate of speed with a minimum of labor, breakage and floor space.



3,559,564
METHODS AND APPARATUS FOR COOKING MEAT PRODUCTS

William J. Turner, Oak Lawn, Wayne E. Henry, Downers Grove, and Gary W. Hubb, Western Springs, Ill., assignors to The Griffith Laboratories, Inc., Chicago, Ill., a corporation of Illinois

Continuation-in-part of application Ser. No. 701,442, Jan. 29, 1968, now abandoned. This application Oct. 7, 1969, Ser. No. 864,463
Int. Cl. A47j *27/62*; F27d *11/00*
U.S. Cl. 99—332 **10 Claims**



Methods and apparatus for cooking meat products confined in casings which utilize the application of controlled intense infrared radiation. In the cooking process an intense infrared radiation source heating the product is impulsed by rapidly turning the source on and off in a cyclic manner. This enables a commercially good product to be obtained in significantly less time than is normally required in the prior art.

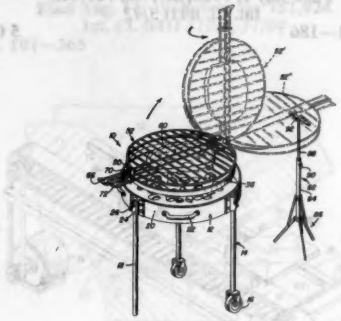
3,559,565
BARBECUE GRILL

Clarence A. Getz, Hot Aprings, Mont. (P.O. Box 316, Davenport, Wash. 99122)

Substitute for application Ser. No. 341,944, Feb. 3, 1964, now abandoned. This application Dec. 24, 1968, Ser. No. 810,879
U.S. Cl. 99—340 **11 Claims**

A fuel receptacle rotatably mounts a frame about a vertical axis which in turn removably supports a food holding grill assembly or rotisserie through which food may be controllably exposed to heat and smoke evolved from the receptacle. The grill assembly may be angularly displaced to a withdrawn

position and to invert the food when positioned over the receptacle. The rotisserie rotates the food over the receptacle below a hood that may be mounted on the rotisserie frame.

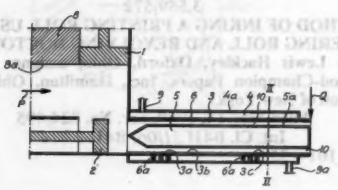


3,559,566

METHOD FOR DEHYDRATING GREEN CROP

John Axel Aspegren, Stockholm, Jan Anders Askling, Tullinge, and Lars-Ingvar Larsson, Tullinge, Sweden, assignors to Alfa-Laval AB, Tumba, Sweden, a corporation of Sweden

Filed Nov. 14, 1967, Ser. No. 682,801
Claims priority, application Sweden, Nov. 18, 1966, 15807/1966
Int. Cl. B30b *15/34*
U.S. Cl. 100—38 **9 Claims**



The green crop is compressed and, during the compressing operation, is heated to a temperature of at least about the boiling point of water at the prevailing gas pressure; and the moisture emitted from the crop as a result is allowed to escape. Preferably, the green crop is held compressed during part of the time when steam is leaving it due to the heating, whereby a self-sustained or coherent end product is obtained.

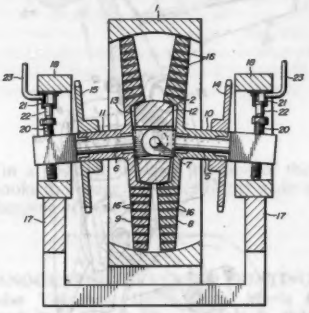
3,559,567

CONTINUOUS SQUEEZING APPARATUS OF A ROTARY DISC TYPE

Ryutaro Yoritomi, 17—12, Koishikawa-5-chome, Bunk yo-ku, Tokyo, Japan

Filed June 24, 1969, Ser. No. 835,937
Claims priority, application Japan, July 6, 1968, 43/46901
Int. Cl. B30b *3/04*
U.S. Cl. 100—158 **3 Claims**

An apparatus for continuously squeezing liquid out of liquid containing material at a predetermined squeezing pressure having a pair of squeezing discs, each rotatably mounted on a shaft slightly inclined with respect to each other, said discs being disposed opposite to each other to define an annular groove of a V-shaped cross section between their confronting inner conical surfaces. The apparatus is provided with means for adjusting the inclination of the shafts to control the spacing of said V-shaped groove and means for supporting the respective outer ends of said shafts by a controlled supporting force for said shafts in accordance with a predetermined squeezing pressure.

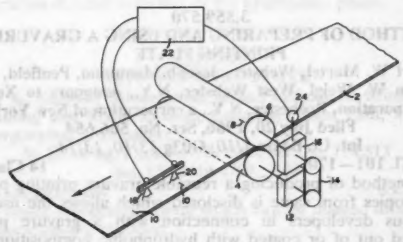


3,559,568

METHOD OF CONTROLLING PATTERN REPEAT LENGTH

Edward W. Stanley, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa., a corporation of Pennsylvania

Filed Jan. 14, 1969, Ser. No. 791,087
Int. Cl. B44c *1/24;* **B41f** *13/10;* **G01n** *21/30*
U.S. Cl. 101—32 **1 Claim**

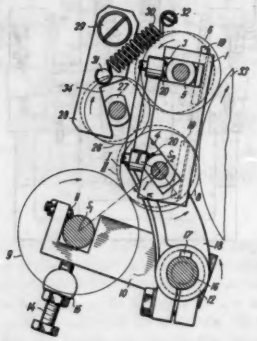


The method of controlling the repeat length of a pattern to be embossed on sheet flooring. The embossed material is provided with register marks which appear once for each pattern length. Photocells scan the register marks on the embossed product and sense any deviation from a predetermined spacing. The information sensed by the photocells is transmitted to a computer which operates a DC correction motor to adjust the drive of the embossing roll to return the spacing of the register marks to the predetermined spacing.

3,559,569
DAMPING UNIT FOR AN OFFSET PRINTING MACHINE

Josef Jurny, Sebranice, Czechoslovakia, assignor to Adamovske strojirny, narodni podnik, Adamov, Czechoslovakia

Filed Feb. 24, 1969, Ser. No. 801,500
Claims priority, application Czechoslovakia, Feb. 23, 1968, 1389-68
Int. Cl. B41f 7/40
U.S. Cl. 101—148 6 Claims



In a damping unit having two applicator rollers connected by a transfer roller and a distributor roller engaging only one of the applicator rollers, the bearings of the applicator rollers are guided between an inoperative and an operative position relative to the plate cylinder in converging slots of a guide bracket. The bearing of the applicator roller in direct contact with the distributor roller moves in a slot which is perpendicular to a plane through the axes of the distributor roller and of the directly engaged applicator roller when the latter is at the midpoint of its path between the operative and inoperative positions, thereby making the contact pressures between the two rollers precisely equal in the two positions.

3,559,570
METHOD OF PREPARING AND USING A GRAVURE PRINTING PLATE

Robert W. Martel, Webster, Joseph Mammino, Penfield, and John W. Weigl, West Webster, N.Y., assignors to Xerox Corporation, Rochester, N.Y., a corporation of New York

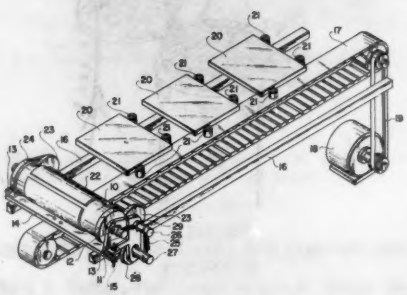
Filed July 20, 1966, Ser. No. 566,654
Int. Cl. B41m 1/10; G03g 13/10, 13/14
U.S. Cl. 101—170 14 Claims

A method of producing a reusable gravure printing plate and copies from same is disclosed which allows the use of aqueous developers in connection with a gravure plate molded out of or coated with hydrophobic composition. It has been found that when electrostatic charges are placed on the surface of a charge carrier having hydrophobic properties aqueous liquids formerly incapable of wetting the surface now are retained by reason of the presence of the electrostatic charge pattern. This discovery is employed in conjunction with the gravure imaging process of the present invention. For, example, a gravure dispensing member is coated with a layer of hydrophobic photoconductive composition. The resulting photoconductive gravure member is electrostatically charged in the dark selectively exposed and developed using an aqueous base developer employing well-known xerographic techniques. The developed surface of the plate may then be contacted to a copy sheet to produce a reproduction of the original.

3,559,571
IMAGE TRANSFER MECHANISM

George W. Scherer and John S. Pollock, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y., a corporation of New Jersey

Filed July 1, 1968, Ser. No. 741,448
Int. Cl. B41f 3/42
U.S. Cl. 101—186 5 Claims

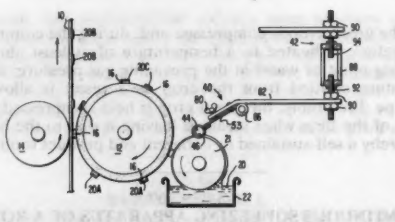


In one embodiment, a transfer roller is provided, which is driven through idler wheels which are adjustable to selectively vary the frictional force between the idler wheels and the rails upon which they ride. Also, the spacing between the transfer roller and the photoconductive chips is adjustable independently of the frictional force between the idler wheels and rails. In another embodiment, one of the rails is segmented, with the chips providing the remaining portion of the one rail. These rails may be adjusted to vary the frictional force and the spacing of the transfer roller from the chips. Shims may be provided as needed on the photoconductive chips in the rail area.

3,559,572
METHOD OF INKING A PRINTING ROLL USING A METERING ROLL AND REVOLVING DOCTOR ROD

Kenneth Lewis Hackley, Oxford, Ohio, assignor to U. S. Plywood-Champion Papers, Inc., Hamilton, Ohio, a corporation of New York

Filed May 14, 1969, Ser. No. 824,495
Int. Cl. B41f 31/06; B41l 27/14
U.S. Cl. 101—350 6 Claims



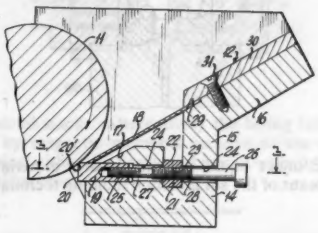
A printing apparatus and method wherein ink is conveyed to a printing roll via a metering roll, covered with a resilient surface, which is doctored by a flexible doctor having a moving doctor edge.

3,559,573

INK FOUNTAIN ASSEMBLY AND BLADE ADJUSTING MEANS THEREFOR

George E. Hantscho, Eastchester, N.Y., assignor to George Hantscho Company, Inc., Mount Vernon, N.Y., a corporation of New York

Filed Aug. 12, 1968, Ser. No. 751,924
Int. Cl. B41f *31/06, 31/04*
U.S. Cl. 101—365 4 Claims



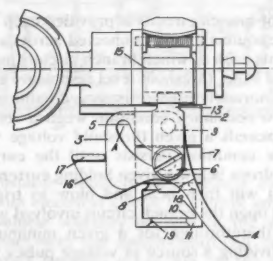
An ink fountain assembly embodying a plurality of independently adjustable elements forming part of the blade assembly for controlling the supply of ink to the ink roller.

3,559,574

CLAMP FOR SECURING AN INK TUBE TO A PRINTING PRESS INK PUMP

Albert George Ronald Gates, Tottenham, England, assignor to Gestetner Limited, London, England, a British company

Filed Feb. 20, 1969, Ser. No. 801,006
Claims priority, application Great Britain, Feb. 22, 1968, 8764/68
Int. Cl. B41f *31/08*
U.S. Cl. 101—366 13 Claims



A device for clamping an ink reservoir to a duplicator ink pump, including a slidable jaw to pull the reservoir nozzle against an ink conduit and a feeler movable across a mouth of the jaw to detect the presence of a partly inserted nozzle and either to push the nozzle home or to prevent further sliding of the jaw.

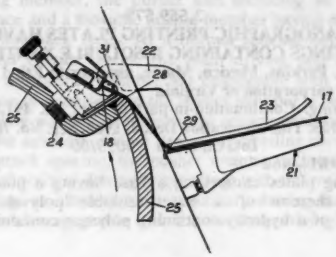
3,559,575

CLAMP INCLUDING ADJUSTABLE ABUTMENT MEANS FOR ATTACHING A FLEXIBLE PLATE TO A PRINTING CYLINDER

Francis V. Magrath and Thomas George Selman, London, England, assignors to Gestetner Limited, London, England, a British Company

Filed June 6, 1968, Ser. No. 734,958
Claims priority, application Great Britain, June 21, 1967, 33,733
Int. Cl. B41f *27/06*
U.S. Cl. 101—415.1 9 Claims

The invention provides a plate clamp for a printing cylinder in which the clamp includes an array of hooks adjustably spaced from an abutment surface so that a trailing printing plate having suitable holes near one edge may be mounted in the clamp. A further abutment surface is provided to cooperate with a plate loading tray in order that a plate being loaded from the tray strikes the further surface



and is held in a position in which rotation of the cylinder causes the hooks to engage the holes of the plate and effect automatic clamping of the plate.

3,559,576

PLANOGRAPHIC REVERSED PRINTING

Marcel Nicolas Vrancken, Hove; Louis Maria De Haes, Edegem, and Daniel Alois Claeys, Mortsel, Belgium, assignors to Gevaert-Agfa, N.V., Mortsel, Belgium, a Belgian Company

No Drawing. Filed Oct. 24, 1967, Ser. No. 677,752
Claims priority, application Great Britain, Oct. 24, 1966, 47,632/66
Int. Cl. B41m *1/08*
U.S. Cl. 101—450 5 Claims

A process for producing planographic prints wherein the printing plate is prepared from a heat-sensitive recording material formed of a support, an interlayer of a water-permeable hydrophilic colloid and an external water-permeable layer of at least one hydrophobic substance which melts on heating and in such molten condition is absorbed into the hydrophilic colloid interlayer by exposing such recording material to a pattern of heat to bring about differential absorption of the hydrophobic substance in the heated regions of the layer thereof to thereby expose portions of the hydrophilic layer in a pattern corresponding to the heat pattern. The planographic plate thus produced is inked with a generally hydrophilic printing ink selectively adhering to the hydrophilic portions, and the ink is transferred to a copy material to produce the desired print. Preferably, the hydrophobic substance is miscible or compatible in its molten state with the hydrophilic colloid of the interlayer. A particularly useful printing ink consists of a colored hydrophilic continuous phase in which is dispersed a lipophilic phase of coloration distinct from that of the hydrophilic phase.

3,559,577

LITHOGRAPHIC PLATE

Burt K. Sagawa, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Mo., a corporation of Delaware

No Drawing. Filed Nov. 8, 1968, Ser. No. 774,513
Int. Cl. B41n *1/00, 3/00*
U.S. Cl. 101—460 6 Claims

A paper lithographic plate which can be imaged in an automatic-copying machine.

3,559,578

LITHOGRAPHIC DUPLICATING METHOD AND LITHOPLATE MASTER THEREFOR

Theodore A. Haas, Maplewood, and Collin H. Alexander, Falcon Heights, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware

No Drawing. Filed Sept. 19, 1968, Ser. No. 773,358
Int. Cl. B41m *5/00*; B41n *3/00*
U.S. Cl. 101-467 12 Claims

A high quality long run lithographic-printing plate is produced by applying an alpha-naphthol first reactant at

image areas to a lithoplate master containing an ionic iodide coreactant, most particularly a quaternary ammonium iodide coreactant, and heating the plate.

3,559,579
PLANOGRAPHIC PRINTING PLATES HAVING COATINGS CONTAINING INSOLUBLE XANTHATES

Glenn H. Perkins, Mexico, Maine, assignor to Ethyl Corporation, a corporation of Virginia

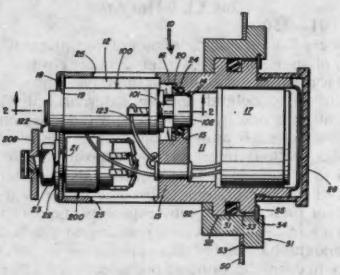
No Drawing. Continuation-in-part of Ser. No. 491,869, Sept. 30, 1965. This application Dec. 4, 1968, Ser. No. 781,235
Int. Cl. B41n *1/00, 3/00*
U.S. Cl. 101—462 10 Claims

Printing plates comprising a base having a planographic coating thereon of a water-insoluble polyvalent metal xanthate of a hydroxy-containing polymer containing a pigment.

3,559,580
FLOODER ASSEMBLY

Robert J. Lyon, Silver Spring, Md., assignor to the United States of America as represented by the Secretary of Navy

Continuation-in-part of application Ser. No. 339,308, Jan. 21, 1964, now Patent No. 3,205,321. This application July 27, 1965, Ser. No. 475,631
Int. Cl. F42b *22/22*
U.S. Cl. 102—13 1 Claim



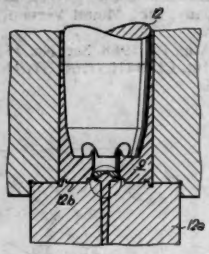
A water activated battery initiated electrolytic timing device for controlling the delay period prior to flooding of a mine incorporating the flooding assembly. The electrolytic timer incorporates a valve actuation device for establishing fluid communication between a body of water external thereto and the interiormost chamber of the flooder assembly.

3,559,581
METHOD OF MANUFACTURE OF THIN-WALLED PLASTIC SHELL CASINGS

Roman Kriz, Vlasim, Josef Hrdina, Rimovice, and Josef Svejda, Vlasim, Czechoslovakia, assignors to Blanicke strojirny narodni podnik, Vlasim, Czechoslovakia, a firm

Continuation-in-part of application Ser. No. 592,586, Nov. 7, 1966, now abandoned. This application Dec. 5, 1968, Ser. No. 781,551
Int. Cl. F42b *9/30*
U.S. Cl. 102—43 2 Claims

A method for manufacturing plastic shell casings having relatively thin-walled tubular bodies. The tubular bodies of the shell casings manufactured in accordance with the method of this invention have cylindrical walls and a bottom which is integral with said cylindrical walls. The outer bottom edge of the shell casing has a rim member which extends downwardly therefrom. Cumulative liquid polymer plastic distribution means are mounted at the bottom of a mold having a shape corresponding to that of the finished plastic shell

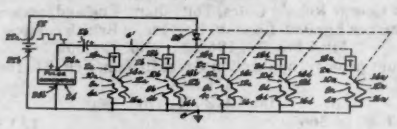


casing and inject liquid polymer plastic material into the mold by means of the slit injection molding technique.

3,559,582
SQUIB CONTROL CIRCUIT

Bohuslav A. Hrzek, Troy, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich., a corporation of Delaware

Filed Dec. 27, 1968, Ser. No. 787,477
Int. Cl. F42c *11/00, 11/06, 15/06*
U.S. Cl. 102—70.2 8 Claims



A number of branch circuits is provided each containing a low resistance squib element connected across a pair of voltage input points each of which branch circuits includes a self-resetting, solid state, threshold level responsive switch device which is in a normally high resistance condition and is triggered to a low resistance condition when a voltage applied thereacross exceeds a given threshold voltage value, which low resistance condition persists until the current flowing therethrough drops below a given holding current level. Each squib element will then heat and blow to trigger a given operation and open the branch circuit involved when the current persists therethrough for a given minimum duration. Means for providing a source of voltage pulses is connected across the input points which pulses preferably exceed the threshold voltage values of all of the threshold level responsive switch devices in the branch circuits. The voltage responsive characteristics of the switch devices vary somewhat so only one of the switch devices is triggered into its low resistance condition for each pulse to effect a flow of current for said duration to blow the associated squib element.

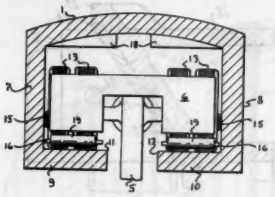
3,559,583
OVERHEAD RAILWAY

Lucien Felix Chadenson, Paris, France, assignor to Safege Transport, Paris, France, a company of France

Filed Apr. 8, 1968, Ser. No. 719,370
Claims priority, application France, Apr. 10, 1967, 102,110
Int. Cl. B61b *3/00;* B60v *1/00*
U.S. Cl. 104—89 5 Claims

An overhead railway system wherein a car body is suspended from a plurality of bogie trucks traveling in a boxlike beam having a longitudinally extending slot in its lower face. The trucks are supported and propelled by a plurality of pneumatic tired wheels in running engagement with horizontal tracks defined by the upper surfaces of the flanges adjacent to the slot. High-speed operation is improved by reducing the tire load while maintaining adequate tire ad-

herence for propulsion and braking. This is achieved by means of air cushion members supported by the trucks and arranged so that their lower faces are substantially parallel to



the horizontal tracks. Alternatively the lifting force may be provided by magnetic members secured to the trucks and acting against either the horizontal track or the upper surface of the boxlike beam.

3,559,584

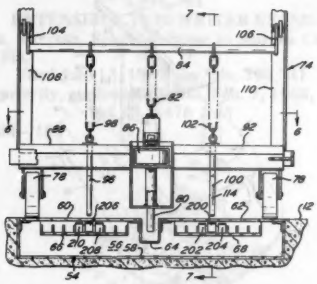
TOW TRUCK SWITCHING SYSTEM

Robert R. Frantz, Easton, Pa., and Sandford G. Franklin, Milford, N.J., assignors to SI Handling Systems, Inc., Easton, Pa., a corporation of Pennsylvania

Filed June 10, 1968, Ser. No. 735,680

Int. Cl. B61j *3/00*

U.S. Cl. 104—88 **12 Claims**



Preset adjustable members on a vehicle electromagnetically control an electrical circuit to control switching movement of a vehicle whereby no part of the vehicle makes physical contact with the switch-controlled mechanism except for contact between a tow pin on the vehicle and a diverter.

3,559,585

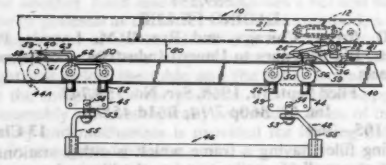
POWER AND FREE CONVEYOR

George D. Lempio, Detroit, Mich., assignor to Jervis B. Webb Company, a corporation of Michigan

Filed Mar. 28, 1969, Ser. No. 811,469

Int. Cl. B65g *17/42*

U.S. Cl. 104—172 **18 Claims**



A conveyor of the power and free type having a power track for a propelling member spaced above a carrier supporting track. Each carrier is provided at the front end with a rigid main driving dog and at the rear end with a rigid combination releasing cam and auxiliary driving dog. Forwarding motion is imparted to a carrier by a pusher unit on the propelling member, the pusher unit including an auxiliary driving face and a movable pusher member having main driving and holdback faces. At a normal spacing between the power and carrier tracks, the main driving and holdback faces on the pusher member are engageable with the main driving dog of a carrier and the pusher member is movable to a nondriving position in response to engagement with a stop or with the auxiliary driving dog of a preceding carrier. At a reduced track spacing, the pusher member is movable to a position of positive driving engagement with the main carrier driving dog, or alternately, the auxiliary driving face of the pusher unit is engageable with the auxiliary driving dog of a carrier.

3,559,586

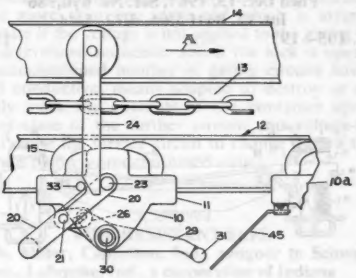
RETRACTING PUSH-ROD ASSEMBLY FOR CONVEYORS

Richard D. Follrath, Birmingham, Mich., assignor to Rapistan, Incorporated, Grand Rapids, Mich., a corporation of Michigan

Filed Nov. 29, 1968, Ser. No. 779,706

Int. Cl. B65g *17/42*

U.S. Cl. 104—172 **4 Claims**



A linkage to effect the automatic release of the trolleys of a power and free conveyor from the continuously moving propelling member in which the arm which connects the trolley to the propelling member is hingedly jointed to a sensing lever which is pivotally shifted upon contact with an obstruction ahead of the trolley such as a preceding trolley stalled on the track. The hinge provides a connection which locks the arm in erected propelling member engaging position and positively holds the arm in retracted position, out of engagement with the propelling member, when the sensing lever is pivotally shifted by contact with an obstruction.

3,559,587

SPRING LOADER TRACTION INCREASING APPARATUS

Cordis W. Jones, Salina, Kans., assignor to Hastings Dynamold Corporation, Hastings, Nebr., a corporation of Nebraska

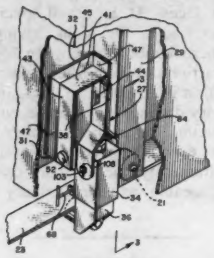
Filed Mar. 25, 1968, Ser. No. 715,738

Int. Cl. B61c *11/00, 15/00*; F01c *23/06*

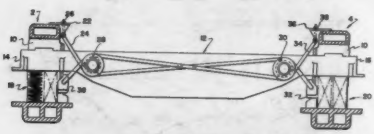
U.S. Cl. 105—73 **5 Claims**

This invention relates to a device for placing reaction load on heavy duty equipment to maintain the required traction, and, more particularly, to a spring loader apparatus connectable between a support base and a machine device to provide the downward counterbalancing force needed in cutting- and grinding-type operations. Still, more specifically, this invention relates to a spring loader apparatus connectable to a heavy duty machine including an attachment frame connected to a machine; a main housing connected to the attachment frame having a roller member engageable with an anchored support base; a spring member mounted within the main housing to bias the roller member upwardly against the

support base; and a cam assembly engageable with the spring member to achieve a load on the spring member in order to bias the heavy duty machine downwardly usable, for example, in grinding and/or cutting operations on a concrete slab or the like.



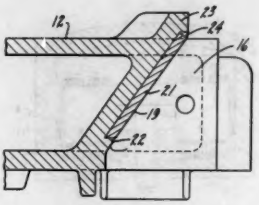
3,559,588
RAILWAY BOGIE WITH SNUBBED BOLSTER
Robert W. Luebke, Baltimore, Md., assignor to General Standard Company, Chicago, Ill., a corporation of Illinois
Filed Dec. 15, 1967, Ser. No. 690,986
Int. Cl. B61f *5/06, 5/12, 5/44*
U.S. Cl. 105—197 **11 Claims**



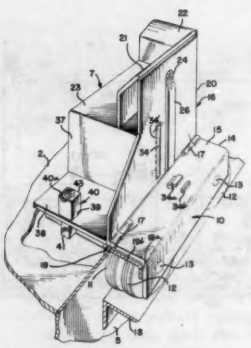
An apparatus and method designed to prevent the excessive roll of freight cars caused by uneven tracks, track curves and uneven roadbeds. The apparatus and method discussed herein are designed to produce a predetermined biasing tension on the bolster member between the side frame of a freight car truck in a manner such that most of the rolling motion of the car body, which is supported on the truck, is converted from essentially a roll motion to a substantially vertically directed controlled motion. While the method is designed to convert freight car roll motion to essentially vertical motion, the apparatus used to carry out the method may be varied. The preferred system utilizes at least one cable secured to one of the side frames of a freight car truck and which extends therefrom into contact with biasing devices secured to the bolster portion of the truck and which is finally connected to the opposite side frame. Acceptable results can be produced utilizing a plural rod, link pin assembly, an electromagnetic biasing arrangement, or a hydraulic biasing arrangement.

3,559,589
BOLSTER-DAMPENED FREIGHT CAR TRUCK
Ray C. Williams, Chicago, Ill., assignor to Standard Car Truck Company, Chicago, Ill., a corporation of New Jersey
Filed Sept. 6, 1968, Ser. No. 757,845
Int. Cl. B61f *5/06, 5/12*
U.S. Cl. 105—197 **3 Claims**

In a railroad car windowed side frame and bolster combination, a removable inclined antifriction bearing pad on the bolster is in contact with the inclined face of a spring-biased, stabilizing wedge, so that the frictional resistance to upward movement of the wedge is minimal to permit the spring to cause maximum lateral pressure of the wedge, against a vertical friction surface on the side frame, to increase the stabilizing effect of the wedge. The plate is dovetailed into the bolster at its lower edge and is locked in place by a weld between the plate and a ledge projecting from the bolster at its upper edge.



3,559,590
CONTAINER VEHICLE AND ADJUSTABLE BRACKET MEANS THEREFOR
Jack E. Gutridge, Dyer, Ind., assignor to Pullman Incorporated, Chicago, Ill., a corporation of Delaware
Filed Nov. 6, 1968, Ser. No. 773,934
Int. Cl. B61d *45/00*
U.S. Cl. 105—366 **7 Claims**

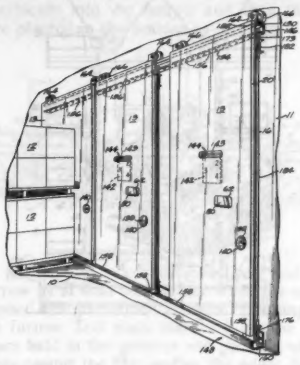


In a container carrying flat deck railroad car, a plurality of container supporting adjustable brackets, each bracket comprising a roller carriage means moved along and retained by the side portion of the flat deck car, the carriage means pivotally carrying an upright container-supporting member provided with a container corner seat and lock means insertable in a set of longitudinally spaced apertures for securing the bracket support member to the deck and having container indexing and tying means for attaching the container corner to the support member, said support member being foldable into a recess on the deck to lie flush with the deck or tilted outwardly and supported by a stilt for movement thereof longitudinally of the deck by the roller carriage.

3,559,591
LADING FILLER
Henry D. Breen, Chicago, and Russell M. Loomis, Palos Heights, Ill., assignors to Unarco Industries, a corporation of Illinois
Filed Sept. 10, 1968, Ser. No. 758,747
Int. Cl. B60p *7/14;* **B61d** *45/00*
U.S. Cl. 105—369 **13 Claims**

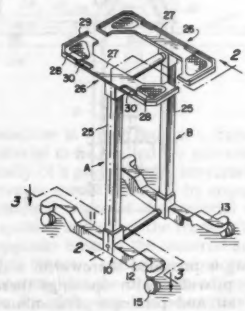
A lading filler having a frame which is either stationarily mounted on a wall of a railway car or the like or is moveable along a sidewall on elongated tracks. A panel is adjustably mounted on the frame by two sets of moveable crossed arms and each set is connected by a pair of moveable tie bars. A locking arrangement is provided for locking the panel in one

of its adjusted positions which includes a member which is moveable by and in the same direction as ends of the crossed



arms. Further latching means are provided for locking the panel to the frame and for preventing movement along the sidewall.

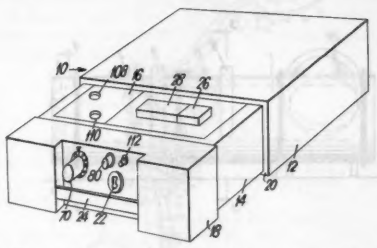
3,559,592
EXTENSIBLE TYPEWRITER STAND
Jose Closa, Tarrasa, Spain, assignor to Aurora Corporation, Miami, Fla.
Filed Jan. 13, 1969, Ser. No. 790,741
Claims priority, application Spain, Feb. 7, 1968, 136,363
Int. Cl. A47b *1/08*
U.S. Cl. 108—102 **9 Claims**



This specification discloses an extensible stand designed primarily for the support of typewriters. The stand comprises two complemental assemblies adjustable horizontally relative to one another. Each assembly comprises a vertical standard, a base or pedestal at the lower end of the standard, a table at the upper end of the standard, and two horizontal tubular supports. One of these supports extends laterally from the upright just below the table and the other extends laterally from the midpoint of the pedestal. The tubular supports of one assembly are telescopically received in those of the other assembly and mechanism is provided for locking these supports in an adjusted position.

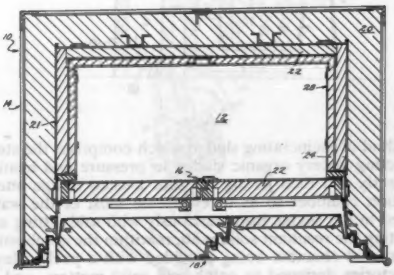
The present invention relates to extensible stands intended for the support of typewriters and is concerned primarily with a stand that is mobile, has a high degree of stability, is readily adjustable to accommodate a typewriter of a particular size, and is easily locked in an extended position.

3,559,593
SECURITY CONTAINER
Edward A. Munton, Thorpe Bay, Essex, and Alan Birt Acres, Leigh-on-Sea Essex, England, assignors to Vigil Security Limited, Sussex, England, a British company
Filed July 15, 1969, Ser. No. 841,878
Claims priority, application Great Britain, July 18, 1968, 34283/68
Int. Cl. E05g *3/00*
U.S. Cl. 109—25 **10 Claims**



A portable security container adapted to contain valuable articles and comprising a lock which when opened permits access to the interior of the container, a security circuit comprising a plurality of gating circuits, means adapted to apply a voltage from a voltage source within the container to each gating circuit to render it conductive, a further circuit which can take more than one state and which is arranged to change state if the voltage is not applied to the gating circuits in a predetermined sequence, and if the lock is opened before a predetermined number of gating circuits have been rendered conductive, means adapted to destroy or characteristically mark the contents of the container upon said change of state of the further circuit, and voltage-sensing means to cause the further circuit to change state if the said voltage falls below a predetermined value.

3,559,594
FIRE RESISTANT SAFE
Walter N. Miller, Cannelton, Ind., assignor to Schwab Safe Co., Inc., Lafayette, Ind., a corporation of Indiana
Filed July 14, 1969, Ser. No. 841,284
Int. Cl. E04b *2/02*
U.S. Cl. 109—84 **8 Claims**



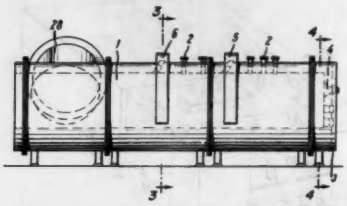
A fire resistant safe, particularly for the storage of EDP records such as magnetic tapes, discs, microfilm and the like, wherein an inner storage area or repository is surrounded by at least three layers of heat resistant material, an outer layer of concrete, a middle layer of insulation such as urethane foam separated from the concrete by a polyethylene moisture shield and an inner layer comprised, at least in part, of Sodium Acetate Trihydrate which is a material with a heat fusion of 100 B.t.u. per lb., a melting point in the range of 136—144° F. and a density of approximately 90 lbs. per cubic foot. Such a safe has been shown to maintain the temperature of its inner repository below 150° F. and the relative humidity of the repository below 85 percent for 4 hours when subjected to an external temperature of 2000° F.

3,559,595

INCINERATION SYSTEM FOR BURNABLE LIQUIDS OR SLUDGES

Hermann Appelhans, Kassel, and Wolfgang Schumann, Hannoversch-Munden, Germany, assignors to Polyma Maschinenbau, Dr. Appelhans G.m.b.H., Frankfurt, Germany

Filed Nov. 25, 1968, Ser. No. 778,401
Int. Cl. F23g 5/00
U.S. Cl. 110—7 **4 Claims**



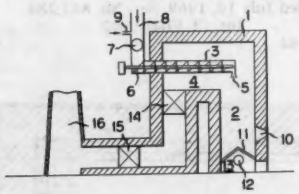
In an incineration system with an incineration muffle for burnable liquids or sludges of different heating value, different ignition temperature and/or different viscosity and which possibly contain nonburnable substances, an improved means to feed the material to be incinerated from the roof of the muffle characterized by a plurality of feed tubes depending through the roof with air feed devices being arranged closely adjacent thereto.

3,559,596

METHOD AND APPARATUS FOR INCINERATING SLUDGE

Kazuo Ishii and Mutsuo Koizumi, Tokyo, Japan, assignors to Kurita Water Industries Ltd, Osaka-shi, Japan, a corporation of Japan

Filed Mar. 18, 1969, Ser. No. 808,140
Claims priority, application Japan, Mar. 23, 1968, 43/18,808
Int. Cl. F23g 5/04
U.S. Cl. 110—7 **10 Claims**



A method of incinerating sludge which comprises the steps of subjecting watery organic sludge to pressure and heating concurrently and then jetting the thus treated sludge into a combustion chamber so as to evaporate most of the water contained in the sludge instantaneously with said jetting and incinerating the resultant solid matters within the combustion chamber, said chamber being provided with a packed layer of refractories designed to catch said solid matters, and an apparatus pertaining thereto.

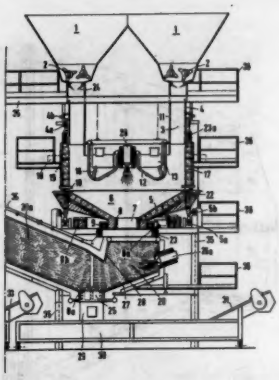
3,559,597

INCINERATOR

Bernhard Heiny, Wolfsburg, Germany, assignor to Volkswagenwerk A. G., Wolfsburg, Germany, a corporation of Germany

Filed Jan. 29, 1969, Ser. No. 795,126
Claims priority, application Germany, Jan. 30, 1968, Feb. 16, 1968, 1,601,294;1,601,295
Int. Cl. F23g 5/12
U.S. Cl. 110—10 **26 Claims**

Incinerator furnace is gravity fed and includes a secondary combustion chamber beneath the primary chamber. The fire pot of the latter and the outer wall of the furnace stack are rotated. Auxiliary burners in the second chamber ensure



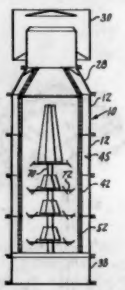
complete burning of the refuse. An exhauster draws the combustion gases through a boiler, and through a prehcater for combustion air, and keeps the furnace at a negative pressure.

3,559,598

REFUSE BURNER

Elson R. McClure, 1427 Carroll Lane P. O. Box 68, Paradise, Calif. 95969

Filed Mar. 21, 1969, Ser. No. 809,264
Int. Cl. F23g 7/00
U.S. Cl. 110—18 **8 Claims**



A vertical casing is provided therewithin with an annular vertical structure provided with openings therethrough for the free flow of air and products of combustion into the space within the casing to facilitate combustion of refuse within the inner wall and a vertically elongated grate structure is provided centrally of the device to facilitate the free flow of air and rapid combustion of the waste material burning operation.

3,559,599

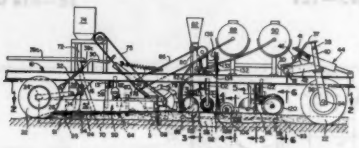
MACHINE FOR PLANTING AND SEALING FURROW WITH TRANSPARENT MATERIAL

Alfred D. Hoadley, Napoleon, Ohio, assignor to Campbell Soup Company, Camden, N.J., a corporation of New Jersey

Filed Dec. 6, 1968, Ser. No. 781,911
Int. Cl. A01g 13/02; A01c 7/18
U.S. Cl. 111—1 **12 Claims**

A field-cultivating machine which while moving across a field forms a selectively shaped furrow in the soil, prepares the soil for planting, plants seeds or seedlings in the furrow, and then forms a closed chamber by sealing a strip of plastic film over the top of the furrow and into the soil along both sides which by limiting temperature range in the furrow,

promotes seed germination and accelerates plant growth. The machine is drawn by a tractor and includes a plow and furrow-shaping structure which support the sides of the furrow while planting and sealing are completed. The soil is prepared by devices which introduce fertilizer, water, insecticide and herbicide into the furrow and then the seeds or seedlings are planted in the bottom of the furrow. A strip of



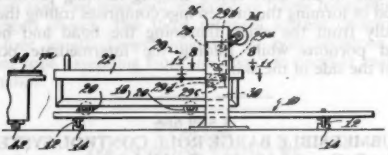
translucent plastic film is continuously laid and supported over the furrow by at least one surface while the edges of the film are pressed into preformed grooves extending along the sides of the furrow. Soil discs place soil on the film edges while they are held in the grooves and packing wheels press the soil firmly against the film sealing the edges. Shaped slits are mechanically made in the film at intervals over the furrow to allow ingress of water and a limited exchange of air.

3,559,600

QUILTING APPARATUS

Frederick E. Kalning, Quincy, and Howard E. Redman, Weymouth, Mass., assignors to Mathewson Corporation, Quincy, Mass., a corporation of MA

Filed Jan. 21, 1970, Ser. No. 004,680
Int. Cl. D05b *1/00, 35/00*
U.S. Cl. 112—118 **18 Claims**



A quilting machine in which there is a frame for supporting a length of material to be quilted for movement transversely and longitudinally of a plurality of transversely disposed sewing heads, conveyor means operable by engagement with the opposite longitudinal edges of the material to move it onto the frame for quilting and off of the frame after quilting, jaws gripping the opposite ends of the material and applying longitudinal tension thereto, underside supports for supporting the material intermediate the opposite edges while moving it onto the frame for clamping, thread cutters for cutting the needle and bobbin threads as the quilted material leaves the machine and mechanism for maintaining a constant speed ratio between the drive shafts of the needle bars and the bobbins throughout vertical movement of the needle bars relative to the bobbins.

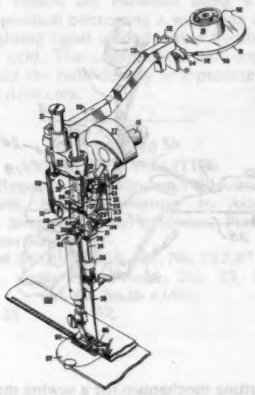
3,559,601

SKIP STITCH MECHANISM FOR HOUSEHOLD SEWING MACHINES

Edward J. Tullman, Union, N.J., assignor to The Singer Company, New York, N.Y., a corporation of New Jersey

Filed Aug. 7, 1969, Ser. No. 848,175
Int. Cl. D05b *3/02*
U.S. Cl. 112—158 **5 Claims**

A needle bar reciprocation interrupting mechanism is disclosed for sewing machines by which the formation of stitches may be intentionally skipped so that extremely long stitches as for basting may be formed, or by which isolated stitch groups may be sewn. In the mechanism disclosed the stitches will be skipped each time the zigzag mechanism jogs the needle bar beyond a range of positions in which it can cooperate with the stitch-forming mechanism to form a stitch. In this manner the complete range of zigzag stitch capabilities of the sewing machine will remain available and the skip stitch mechanism does not require any more than



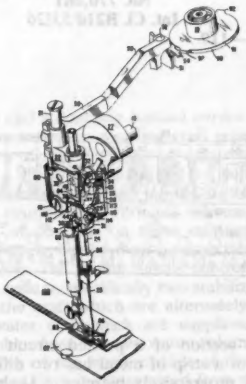
setting of the conventional zigzag control means to render it selectively effective. Also disclosed is a safety cam means by which the needle bar when jogged to an abnormal position will automatically be deflected back into the range of positions capable of forming a stitch in the event that the needle bar interrupting means should accidentally malfunction.

3,559,602

LOCKING DEVICE FOR SKIP STITCH MECHANISMS

Stephen J. Illes, Summit, N.J., assignor to The Singer Company, New York, N.Y., a corporation of New Jersey

Filed Aug. 7, 1969, Ser. No. 848,177
Int. Cl. D05b *3/02*
U.S. Cl. 112—158 **3 Claims**

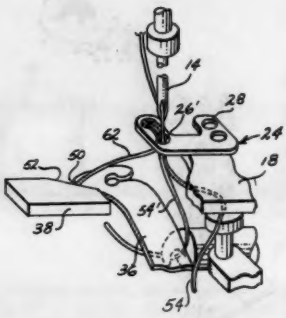


A skipstitch mechanism for household sewing machines is disclosed in which a clutch device is provided for interrupting the needle bar reciprocation so that stitches may be skipped to form extremely long stitches as for basting or the like. The skipstitching is effected by the operation of the zigzag-stitching mechanism of the sewing machine in one position of adjustment of the zigzag control means. A locking device is disclosed for holding the zigzag control means in position to effect skipstitching while the needle bar reciprocation is interrupted by the skipstitch means.

3,559,603
THREAD CUTTING MECHANISM

Gilbert A. Littel, Versailles, Ky., assignor to Textron Inc., a corporation of Delaware

Filed May 27, 1969, Ser. No. 828,173
Int. Cl. D05b *65/00*
U.S. Cl. 112—252 9 Claims

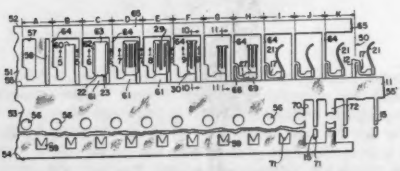


A thread-cutting mechanism for a sewing machine having a finger member movable after the first cyclical stroke of the needle for removing and retaining the beginning end of the thread located underneath the garment from the reciprocal path of movement of said needle. After the last cyclical stroke of the needle, the finger member returns to its rest position and in so doing severs the thread retained by a looper member underneath the garment, whereby both the beginning and trailing ends of the thread are concealed from view.

3,559,604
METHOD OF FORMING SWAGED CONTACTS USING PROGRESSIVE DIE

Herbert E. Ruehleman, Huntington Valley, and Peter Slobodzian, Philadelphia, Pa., assignors to Elco Corporation, Willow Grove, Pa., a corporation of Delaware

Original application Apr. 13, 1967, Ser. No. 630,612, now abandoned. Divided and this application Aug. 15, 1968, Ser. No. 770,461
Int. Cl. B21d *53/26*
U.S. Cl. 113—119 3 Claims

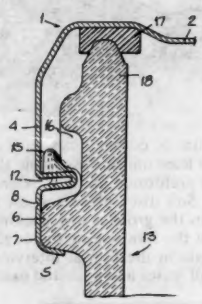


The nose section of a printed circuit board connector stamped from a strip of metal has two different thicknesses achieved by progressively piercing a U-shaped hole in the strip to form a cantilevered lug oriented normal to the grain direction, and then swaging the lug to increase its width and reduce its thickness. The U-shaped hole provides clearance for the two dimensional growth of the lug resulting from the swaging operation without affecting the remainder of the strip which is then progressively pierced to form a cantilevered car oriented in a direction parallel to the grain with the swaged lug supported on the free end of the car. The cantilevered car is then progressively bent along the line perpendicular to the grain to turn the lug so that it defines a surface perpendicular to the car thus establishing the wiping finger of the contact.

3,559,605
LUG TYPE CLOSURE CAP AND METHOD OF FORMING IT

Daniel D. Acton, Lancaster, Ohio, assignor to Anchor Hocking Corporation, a corporation of Delaware

Original application Sept. 1, 1967, Ser. No. 664,982, now Patent No. 3,469,727. Divided and this application May 22, 1969, Ser. No. 842,759
Int. Cl. B21d *51/00*
U.S. Cl. 113—121 2 Claims

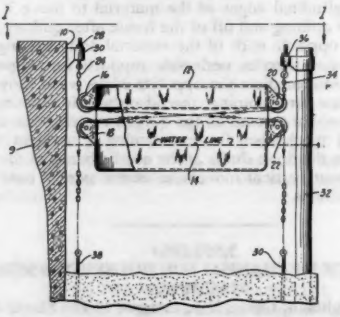


A closure cap having an inwardly rolled bead around its skirt in a zone spaced from the lower edge of the skirt, which bead is flattened against the skirt to give a substantially smooth outer skirt surface and has spaced lugs thereon which are hidden inside the skirt. The lower portion of the skirt may be crimped about a bead on the container to be sealed, creating a barrier against contamination and insect infestation between the container finish and closure skirt, and may be used as a tear strip for unsealing the package by forming a score line in the skirt below the lug forming portion. The method of forming the hidden lugs comprises rolling the bead inwardly from the skirt, flattening the bead and holding spaced portions while folding the intermediate portions against the side of the skirt.

3,559,606
SUBMERSIBLE BARGE ROLL CONTROL SYSTEM

Charles E. Gregory, Anchorville, Mich., assignor to Jered Industries, Inc., Troy, Mich., a corporation of Michigan

Filed Apr. 9, 1969, Ser. No. 814,672
Int. Cl. B63c *1/08*
U.S. Cl. 114—44 6 Claims

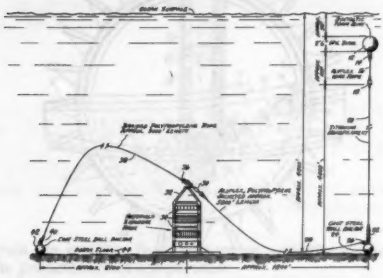


A dry dock comprising a submersible barge located between a pier and piling, sheaves carried by the sides of the barge, and chains trained over the sheaves and extending across the barge in crisscross fashion whereby the barge is maintained in a stable condition regardless of the location of the centers of gravity of the barge and a ship or boat carried by the barge with respect to the center of buoyancy of the barge.

3,559,607
MULTIPLE RETRIEVAL SYSTEM FOR OBJECTS IN SUBMARINE ENVIRONMENT

Aleksander B. Macander, Jersey City, N.J., and Clarence K. Chatten, Jackson Heights, N.J., assignors to The United States of America as represented by the Secretary of the Navy

Filed Jan. 28, 1969, Ser. No. 794,508
Int. Cl. B63c 7/02
U.S. Cl. 114—51 6 Claims

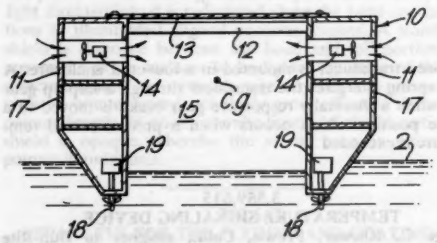


A multiple retrieval system for objects placed on the sea floor for extended periods of time comprising holding means and three retrieval means. The first retrieval means is a vertical line system, the line being fabricated of titanium monofilament fastened to a cast-steel ball anchor at the lower end and a syntactic-foam globular buoy at the upper end which is some 50 feet below the ocean surface. The second retrieval system comprises a 5200-foot length (approximately) of polypropylene-jacketed, aluflex line extending from said cast-steel ball anchor to a frame for holding the submerged object. The third retrieval system comprises a 5,000-foot length (approximately) of polypropylene, self-buoyant rope extending from the frame to another cast-steel ball anchor.

3,559,608
AIR-CUSHION VEHICLES

Edward Gunston Tattersall, Hythe, Southampton, England, assignor to Hovermarine Limited, London, Great Britain, a corporation of the United Kingdom

Continuation-in-part of application Ser. No. 620,713, Mar. 6, 1967, now abandoned. This application Mar. 26, 1969, Ser. No. 810,769
Claims priority, application Great Britain, Mar. 14, 1966, 11,102/66
Int. Cl. B63b 1/38
U.S. Cl. 114—67 23 Claims



An air-cushion vehicle in which the body comprises a laterally-spaced pair of body structures which contain the payload of the vehicle and which are rigidly interconnected and provide therebetween a substantially unobstructed cavity for the air-cushion, the cavity being enclosed by a membraneous canopy sealingly connected to the body structures.

3,559,609
BALLAST

Charles H. Sydow, Jr., and Orien W. Van Dyke, Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex., a corporation of Delaware

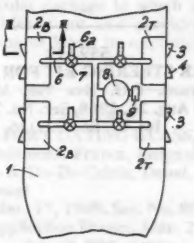
No Drawing. Filed Dec. 27, 1968, Ser. No. 787,584
Int. Cl. B63b 43/06
U.S. Cl. 114—125 10 Claims

Water borne vessels are ballasted using a substantially liquid free composition containing a weighting agent such as barite or a weighting agent coated with a hydrophobic agent such as stearic acid. The composition can contain at least one clay to adjust the bulk density to a predetermined value and at least one desiccant.

3,559,610
ANTIROLL FACILITIES

Albert Viollet, Bagneux, and Edmond Voillaume and Francois Bouilhol, Paris, France, assignors to Association Des Ouvriers En Instruments de Precision, Paris, France, a French body corporate

Filed Dec. 30, 1968, Ser. No. 787,871
Claims priority, application France, Dec. 29, 1967, 134,315
Int. Cl. B63b 43/06
U.S. Cl. 114—125 13 Claims



A weighted rod and a coacting contact carrier frictionally entrainable by a mounting on a rolling craft generate timing signals in positions of maximum lateral excursions of craft with reference to a longitudinal axis, the rod being pivotally mounted aboard the craft on a shaft parallel to that axis so as substantially to maintain a vertical reference position whereby two sets of contacts on these relatively movable members are alternately closed during respective half-cycle of the rolling motion. The timing signals control the operation of an antiroll system, specifically two stabilizer tanks on opposite sides of the craft which are alternately filled with and drained of water and which are supplemented by a further pair of tanks whose relative water volume is altered to balance deviations of the mean attitude of the craft from an upright position as likewise determined from these timing signals.

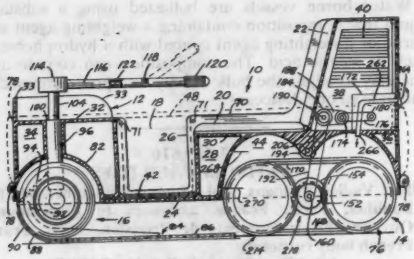
3,559,611
AMPHIBIOUS VEHICLE

Walton W. Cushman, Webb City, Mo., assignor to Martin Tucker, as trustee, New York, N.Y.

Filed Mar. 14, 1968, Ser. No. 713,160
Int. Cl. B63f 3/00
U.S. Cl. 115—1 16 Claims

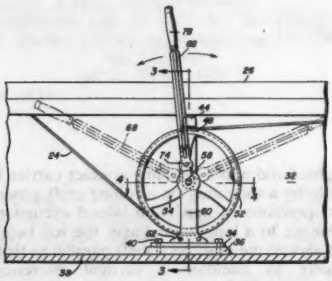
A lightweight, high-performance amphibious vehicle with both off-road and highway operational capability, the vehicle

including a body with variable flotation means for operation over water, front steerable suspension and running gear



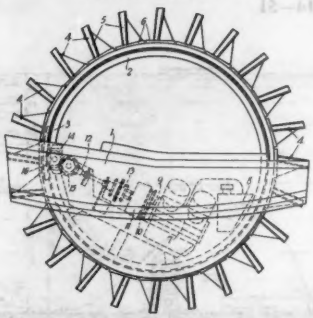
means with reset steering and rear circumferentially loaded and snubbered hubless wheel suspension and locomotion means.

3,559,612
STICK STEERING KIT FOR BOATS
Jacob E. Patterson, P.O. Box 796, Minden, La. 71055
Filed Aug. 26, 1968, Ser. No. 755,120
Int. Cl. B63h *21/26*
U.S. Cl. 115—18 4 Claims



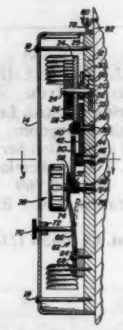
A remote steering assembly for a boat incorporating a pivotally supported steering stick rigid in relation to a grooved wheel to which a steering cable is connected and entrained in such a manner to steerably control the boat from a point adjacent the bow and one side of the boat. The structure of the wheel and its associated structure is such that the cable will be retained in the groove thereby eliminating the possibility of disengagement of the cable. The stick steering enables a person adjacent the bow of the boat to control the direction of the boat and the stick may be oriented in a stored or inoperative position below the top edge of the gunwale of the boat so that a person occupying the front seat thereof may fish off the side of the boat without interference from the steering stick.

3,559,613
PADDLE BOATS
Frederick C. Ashford, 7 Egerton Gardens, London, S.W.3, England
Filed Feb. 7, 1969, Ser. No. 797,629
Int. Cl. B63h *3/00*
U.S. Cl. 115—63 4 Claims



A paddle boat having a hull and a series of paddle blades mounted on a paddle carrier track centrally disposed fore-and-aft of the hull, the paddle blades being driven around the track.

3,559,614
SPRING OPERATED FIRE ALARM
Hal E. Cushman, P.O. Box 25, Ronald, Wash., and Robert W. Bell, Jr., Roslyn, Wash.
Filed Mar. 12, 1969, Ser. No. 806,410
Int. Cl. G08b *17/00*
U.S. Cl. 116—102 3 Claims

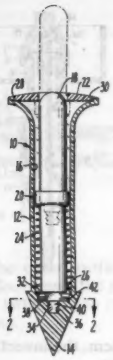


A siren transducer is mounted in a louvered enclosure. A spiral spring energizes the transducer through a step-up gear train when a thermally responsive gear brake is moved to a release position which occurs when a predetermined temperature is exceeded.

3,559,615
TEMPERATURE SIGNALING DEVICE
George G. Kliewer, Fresno, Calif., assignor to Dun-Rite Manufacturing Corp., Fresno, Calif., a corporation of California
Filed Apr. 23, 1969, Ser. No. 818,540
Int. Cl. G01k *1/02*
U.S. Cl. 116—114.5 8 Claims

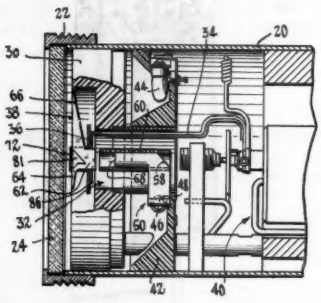
A torsion-loaded indicating member encased within a tubular housing is released from a first orientation for rotational movement to a second orientation upon the attainment

of a predetermined temperature. A fusible element is confined between the indicating member and the housing to



restrain the member from movement until the element fuses at the predetermined temperature.

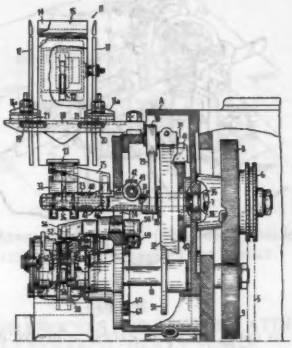
3,559,616
ILLUMINATED INSTRUMENT POINTER
Donald E. Protzmann, Litchfield, Conn., assignor to Lewis Engineering Company, Naugatuck, Conn., a corporation of Connecticut
Filed Nov. 12, 1969, Ser. No. 875,749
Int. Cl. G09f *9/00*
U.S. Cl. 116—129 **7 Claims**



A pointer of light-conducting plastic comprising a shank portion from which there extends in opposite directions respectively a tail portion and a head portion aligned with the tail portion. The shank portion has prism surfaces by which light directed into it is redirected along the head and tail portions to illuminated aligned portions thereof. A translucent shield is disposed between the head and tail portions and covers the prism surfaces to be lighted by some of the light directed against the surfaces, whereby there is presented to view an uninterrupted, relatively great effective illuminated pointer length. In another embodiment of the invention the shield is opaque, whereby the viewer sees an interrupted pointer illumination.

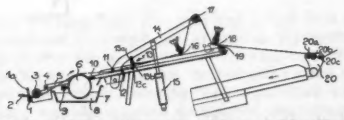
3,559,617
APPARATUS FOR THE FEEDING AND COATING OF CIGARETTE LABELS
Ariosto Seragnoli, Via delle Rose 50, Bologna, Italy
Filed Apr. 15, 1968, Ser. No. 721,527
Claims priority, application Italy, Apr. 20, 1967, 1620A/67
Int. Cl. B05c *11/00*
U.S. Cl. 118—6 **6 Claims**

An apparatus is disclosed for successively affixing labels to packages. The labels are successively fed between an adhesive applying roller and a pressure roller. A coating roller is immerged within a reservoir of adhesive and means are provided to rotationally drive the coating roller to coat the periphery of the adhesive applying roller with adhesive. The pressure roller and the coating roller are each mounted for



movement away from the adhesive applying roller in response to a command signal representative of a condition wherein the particular package to which a label is to be affixed is missing. Means are also provided for temporarily stopping the feeding of labels in response to the command signal.

3,559,618
APPARATUS FOR COATING GLASS FILAMENTS
Robert Basier, Sandemont, France, assignor to Houilleres Du Bassin Du Nord & Du-De-Calais, Douai, France, a French public establishment
Filed Mar. 17, 1969, Ser. No. 807,685
Claims priority, application France, Mar. 29, 1968, 146,476
Int. Cl. B05c *1/04*
U.S. Cl. 118—33 **10 Claims**

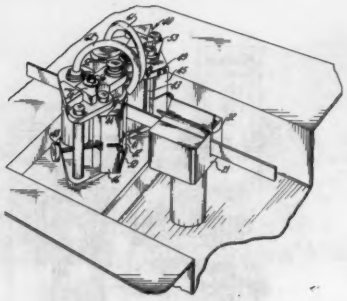


Apparatus for coating glass filaments with a liquid cross-linkable resin, which comprises a freely rotatable roller coater, guide means located upstream of the roller whereby the length of the arc of contact of the filaments with the roller surface may be varied, a combined wiper and recombiner for the coated filaments located downstream of the roller, and tensioning means for tensioning the filaments passing through the apparatus.

3,559,619
APPARATUS FOR APPLYING ADHESIVE ON STRIP MATERIAL
Carl W. Johnson, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis., a corporation of Delaware
Filed Feb. 3, 1969, Ser. No. 795,824
Int. Cl. B05c *11/02*
U.S. Cl. 118—104 **7 Claims**

A gluing unit for applying liquid adhesive to thin-walled paper tape is disclosed. The unit includes a slotted glue head for applying the adhesive to both sides of the tape and a pair of counterrotating rolls for wiping excess adhesive from the surfaces of the tape. The unit also includes a heat exchanger

for heating the glue to make it less viscous and means for flushing the surfaces of the wiping rolls with freshly heated



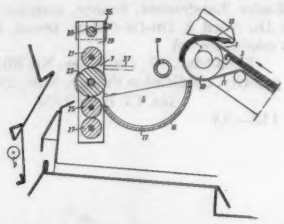
adhesive to carry away the excess adhesive and any foreign matter wiped from the tape.

3,559,620

CONVEYANCE OF ELECTRICALLY CHARGED SHEETS

Martin R. P. Seib, 10, Lodge Drive, The Ryde, Hatfield, Hertfordshire, England

Filed Aug. 16, 1968, Ser. No. 753,297
Int. Cl. B05b *5/02*
U.S. Cl. 118—637 **3 Claims**



An electrophotographic apparatus wherein charged sheets are conveyed from a liquid developer to a dryer by a pair of rollers of insulating material, suitably polyurethane. Each of these insular rollers is engaged by a stainless steel roller which is maintained at a predetermined electrical potential and thereby reduces the amount of electrical charge, picked up by the associated insulating roller, which is returned to a subsequent part of the sheet. The stainless steel rollers may be maintained at a high potential of the same polarity of the toner particles used in the developer, in which case there is a reduction in the number of particles, picked up by the insulating rollers, which is returned to the sheet.

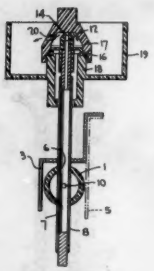
3,559,621

WATERING SYSTEM FOR FOWL

Charles H. Willauer, Jr., Quakertown, Pa.; Doris D. Willauer, executrix of said Charles H. Willauer, Jr., deceased

Filed Jan. 10, 1968, Ser. No. 696,893
Int. Cl. A01k *07/00*
U.S. Cl. 119—81 **8 Claims**

The invention disclosed is an improved low cost system for watering fowl which maintains without overflow a supply of water at one or more drinking stations, with means for stopping the supply of water at each station individually. A new and simplified supply valve at each station which eliminates the usual causes of valve failure is also a feature of the system disclosed. By utilizing feed troughs as the



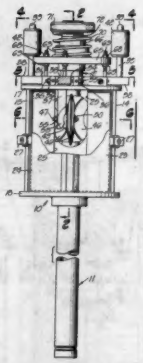
framework for the system, the invention requires no duplicating supporting structure.

3,559,622

WIRE STRIPING APPARATUS

Kenneth Rake, 4250 Madison Ave., Culver City, Calif. 90230

Filed Mar. 17, 1969, Ser. No. 807,651
Int. Cl. B05c *1/04*
U.S. Cl. 118—222 **21 Claims**



A head assembly for striping wire with identification coding as the striping head rotates about the axis of a wire moving vertically through the head assembly. Three striping discs are held pressed against the wire by individual counterbalance means and by common adjustable resilient means. The mechanism includes simple, unique, easily-manipulated means for making several precise adjustments of each disc independently of the other discs.

ERRATUM

For Class 119—81 see:
Patent No. 3,559,621

3,559,623

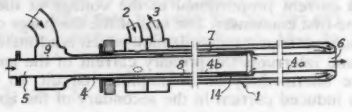
LANCE FOR BLOWING OXYGEN INTO A KALDO FURNACE

Georges Decamps, Paris, France, assignor to Societe Anonyme dite: Societe Lorraine De Laminage Continu, Paris, France, a society of France

Filed Jan. 21, 1969, Ser. No. 792,416
Claims priority, application France, Jan. 25, 1968, 137,485
Int. Cl. F22b *37/00*
U.S. Cl. 122—6.5 **6 Claims**

A lance for blowing oxygen into a Kaldo furnace for refining iron into steel which comprises a main oxygen duct, aux-

iliary oxygen duct means and a cooling circuit. The auxiliary duct means and a cooling circuit. The auxiliary duct means debouch substantially tangentially into the main oxygen duct



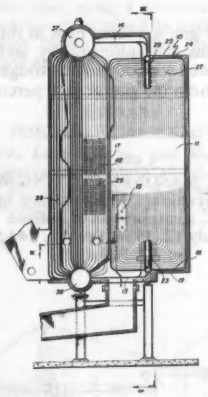
at a point spaced from the outlet orifice of the lance by a distance which is at least four times the mean diameter of the portion of the main duct between the outlet orifice and the auxiliary oxygen duct means.

3,559,624

STEAM GENERATING UNIT

Ramsey Sheikh, Westboro, Mass., assignor to Riley Stoker Corporation, Worcester, Mass., a corporation of Massachusetts

Filed Apr. 26, 1968, Ser. No. 729,491
Int. Cl. F22b *21/02*
U.S. Cl. 122—235 **17 Claims**



This invention relates to a steam generating unit and, more particularly, to apparatus for generating steam in which the heat from the products of combustion is used very efficiently in a compact, prefabricated construction arrangement.

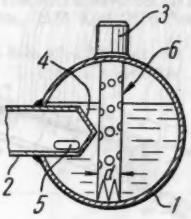
3,559,625

DEVICE FOR DISPENSING A GAS-LIQUID MIXTURE

Ivan Ivanovich Koshelev, Novye Cheremushki, Kvartal 30, Korp. 49, Kv. 52, and Viktor Romanovich Egunov, ul. Pryanishnikova, 88, kv. 9, Moscow, U.S.S.R.

Filed Sept. 6, 1968, Ser. No. 757,811
Int. Cl. F22d *7/00*
U.S. Cl. 122—406 **4 Claims**

A device is provided for dispensing a gas-liquid mixture which comprises a horizontal header with a plurality of inlet pipe connections for a gas-liquid mixture, the header having open discharge pipes connected thereto at the top thereof and containing vertical tubes within the header and provided with holes extending over the entire length of the tubes. The upper end of each tube extends into and in communication with a respective discharge pipe and the lower end is open.



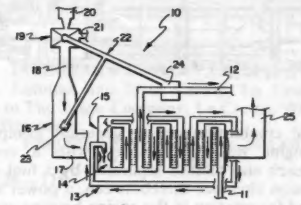
Preferably, the lower ends of the tubes are provided with teeth whose tips rest on the inner wall of the header.

3,559,626

APPARATUS AND PROCESS FOR ACCUMULATING AND CONCENTRATING HEAT ENERGY

Douglas R. Paxton, 426 31st St., Newport Beach, Calif. 92660

Filed Jan. 3, 1969, Ser. No. 788,800
Int. Cl. F22d *7/00*
U.S. Cl. 122—406 **20 Claims**



A tortuous working fluid flow path and a high heat energy gaseous compound flow path are aligned in semicontraflow relationship so that the working fluid and gaseous compound interact and become progressively heated and cooled respectively at controlled rates. Working fluid sequentially enters a bank of tubes near the gaseous compound downstream end and flows to a second bank that directly encounters the most intensely hot portion of the flowing gaseous compound. Working fluid departing the second bank is separated into a portion above a given temperature and another portion below a given temperature that is continuously cycled through a recirculating jet pump and the second bank until its temperature also rises above the given temperature. The working fluid portion above the given temperature, which may be the critical temperature of the working fluid, for example, is further heated in a final bank of tubes and eventually discharged in a high quality state to an ultimate use location.

3,559,627

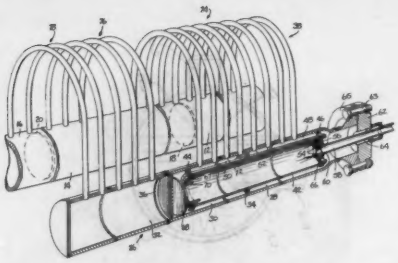
HEAT EXCHANGER

Albert H. Rawdon, Jr., Shrewsbury, Mass., assignor to Riley Stoker Corporation, Worcester, Mass., a corporation of Massachusetts

Filed Dec. 5, 1968, Ser. No. 781,454
Int. Cl. F22g *5/12*
U.S. Cl. 122—487 **15 Claims**

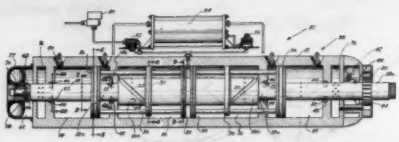
Method and apparatus for controlling the temperature of steam in a superheater wherein steam is passed back and forth between two headers while being superheated, and spray water is mixed with the heated steam in a spray

chamber mounted within one of the headers to evaporate the steam causing the mixed temperature to drop so that more



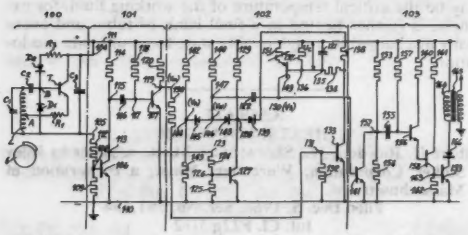
heat may be absorbed in subsequent steam passes without increasing the final steam temperature.

3,559,628
INTERNAL COMBUSTION ENGINE
Luther Evan Boldery, Milton, Ky., assignor to Triangle Research, Inc., Madison, Ind., a corporation of Indiana. by direct & mesne assignments
Filed Aug. 5, 1969, Ser. No. 847,626
Int. Cl. F02b *75/16, 33/06*
U.S. Cl. 123—61 **11 Claims**



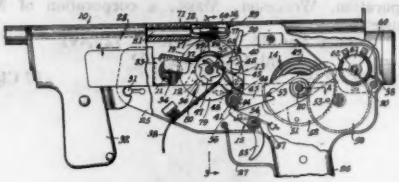
An internal combustion engine generally comprising an elongated engine housing provided with a combustion chamber at each end thereof separated by a fuel induction and compression chamber therebetween, a power shaft centrally mounted for rotation in the engine housing and extending the length thereof through the chambers, and opposed slidable piston means mounted around the power shaft for slidable movement therealong.

3,559,629
STATIC LEAD CORRECTION DEVICE FOR THE IGNITION OF AN INTERNAL COMBUSTION ENGINE
Henri Joseph Sauvignet, Paris, France, assignor to Compagnie Des Compteurs, Paris, France, a company of France
Filed Jan. 24, 1969, Ser. No. 793,708
Claims priority, application France, Jan. 25, 1968, Nov. 21, 1968, 137,342;174,676
Int. Cl. F02p *3/02*
U.S. Cl. 123—148 **8 Claims**



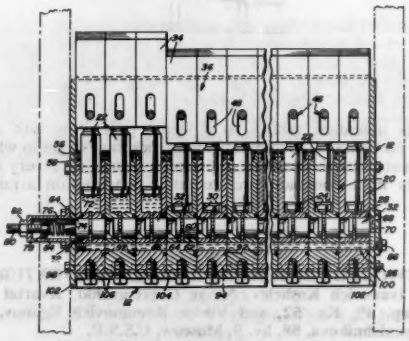
The static correction device for advancing ignition controlled by an electromechanical or electronic detector incorporates a circuit for forming a signal received during the passage of a nonactive part of the cam and issuing a signal which partially charges a first condenser and discharges it during a time equal to the difference between the passage time of the nonactive part of the cam, and the charging time, a second charging condenser partially charging during a time inversely proportional to the speed during the passage of the nonactive part of the cam and completely discharging after that with a current proportional to the voltage at the terminals of the first condenser. The end of the discharge of the second condenser trips a temporization which is a function of the speed and interrupts the primary current of the ignition coil, by the intermediary of an amplifier circuit, so as to produce an induced current in the secondary of the ignition coil.

3,559,630
GUN MECHANISM COMBINING CAP AND PROJECTILE OPERATING MEANS
Kenneth W. Frye, 2117 Lemon St., Alhambra, Calif. 91803
Filed Aug. 19, 1968, Ser. No. 753,580
Int. Cl. F41b *7/08*
U.S. Cl. 124—2 **2 Claims**



An automatic toy gun for firing caps in rolls or strips and provided with means for automatically and intermittently feeding a belt provided with dummy cartridges and to propel one such cartridge from the gun as each percussion cap is exploded.

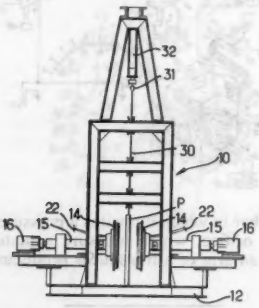
3,559,631
HYDRAULIC MASONRY CUTTING MACHINE
Elmer F. Mangis, Frankfort, Ind., assignor to E & R Manufacturing Co. Inc., a corporation of Indiana
Filed July 12, 1968, Ser. No. 744,505
Int. Cl. B28d *1/32*
U.S. Cl. 125—23 **9 Claims**



A cutting head including a plurality of individual aligned stone splitting knives piston controlled through a common closed reservoir for enabling an accommodation of the knives to surface irregularities through a pressure equalizing flow of fluid between the knife pistons. Upon a firm seating of all of the knives, the continued introduction of pressure

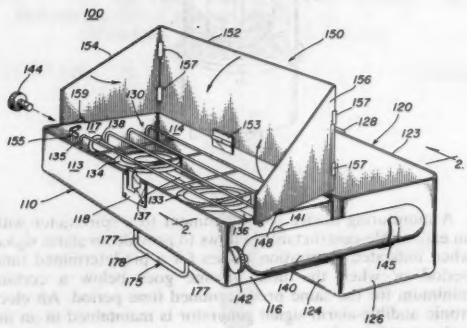
thereto effects, through a series of sliding valves associated with the knife pistons, a locking of each of the knives in its set position until a cutting of the stone is achieved.

3,559,632
PROCESS AND DEVICE FOR CLEAVING LAMINATED MATERIALS
Bernard Viemon, 47 Place A. Gentric, 49 Trelaze, France
Filed Feb. 23, 1968, Ser. No. 707,552
Claims priority, application France, Mar. 29, 1967, P.V.100,568
Int. Cl. B28d *1/32*
U.S. Cl. 125—24 10 Claims



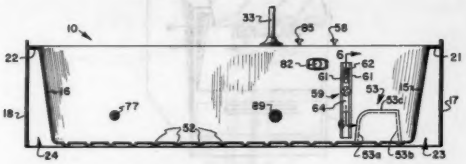
Slates are split from a plate by uniformly gripping, as by suction, the opposite sides of the plate and then moving the gripping elements apart along a common axis at right angles to a plane of cleavage determined by a trigger cut made in an edge of the plate thereby to break the internal cohesive forces of the plane along said plane.

3,559,633
PORTABLE CAMP STOVE
Jerome J. Born, Lincolnwood, and Harry Roehm, Glenview, Ill., assignors to Simonsen Metal Products Corporation, Chicago, Ill., a corporation of Illinois
Filed Mar. 27, 1969, Ser. No. 810,950
Int. Cl. F24c *3/14*
U.S. Cl. 126—38 16 Claims



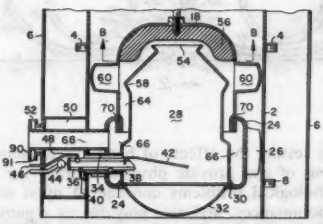
There is disclosed a portable camp stove comprising a plurality of detachably connected singlepiece open-top housing modules of varying depths, at least one of which contains a burner assembly and grate, a foldable windscreen hingedly attached to and latchable in a folded position overlying the one housing, a fuel tank releasably pivotally connected to the burner assembly, means for pivotally supporting the tank on the housings externally thereof, the housings being latchable together in a closed position, and at least the shallower housing having a foldable handle for carrying the stove or supporting the shallow housing in its open position.

3,559,634
THERAPEUTIC BATHTUB
Estelvin Lillywhite, 2523 East 3150 South, Salt Lake City, Utah
Filed Feb. 19, 1969, Ser. No. 800,453
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 10 Claims



A bathtub made sufficiently long for a user to fully recline therein. A nonskid bottom is provided and a combination step and headrest is adjustably positioned along the length of the bottom. An adjustable overflow insures that the water level of the tub will be safely maintained and a hydromassage unit is provided as an aid in hydraulic therapy. An assist and exercise bar is mounted above the tub and the controls for operating the hydromassage unit and for filling and emptying the tub are conveniently positioned at the side of the tub. Removable side panels are provided to facilitate access to all of the controls and mechanical components most apt to be in need of repair.

3,559,635
INTEGRAL FAN-HEAT EXCHANGER
Harry C. Lohman and Irvin Cooley, La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis., a corporation of Wisconsin
Filed Mar. 5, 1969, Ser. No. 804,402
Int. Cl. F24h *3/06*
U.S. Cl. 126—110 6 Claims

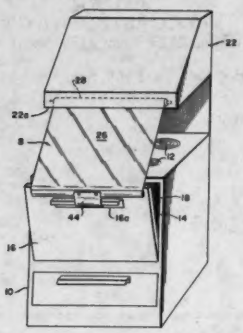


An axial flow fan having a set of rotating blades and a set of stationary blades is combined with a combustion chamber, utilizing the rotating portion of the fan and the stationary blade portion of the fan as heat exchangers. The functions of air movement and air heating are thereby combined into one simple apparatus.

3,559,636
OVEN EXHAUST DEFLECTOR
James S. Marino, 98 Oxford St., Arlington, Mass. 02174
Filed Feb. 20, 1969, Ser. No. 800,898
Int. Cl. F23j *11/00*
U.S. Cl. 126—299 2 Claims

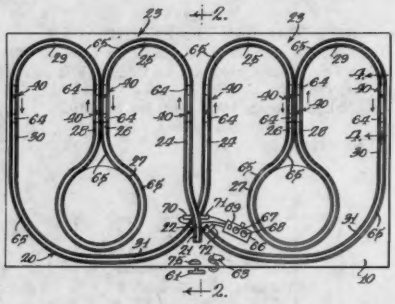
An oven exhaust deflector deflects smoke, gases and fumes issuing from an oven when the oven door is left ajar during broiling to an exhaust hood above the oven. The deflector includes a sheet of flexible, heat-resistant material wound up on a spring-loaded roll affixed inside the front edge of the

hood. During broiling, the sheet is unrolled and attached to the handle on the open oven door so that smoke and gases issuing from the oven are guided upwardly into the exhaust



hood by the unrolled sheet. When the oven is not being so used, the deflecting sheet is wound up on the roll inside the hood.

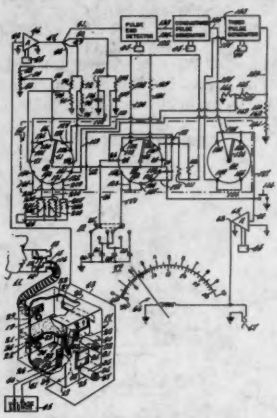
3,559,637
TESTING DEVICE AND GAME
Robert V. Fyanes, P.O. Box 237, Fox Lake, Ill. 60020
Filed Aug. 30, 1968, Ser. No. 756,485
Int. Cl. A61b *5/16;* **A63b** *67/00;* **A63f** *9/14*
U.S. Cl. 128—2 **8 Claims**



Device for testing the effects of hand-eye dominances to aid in analysis of and provide physical therapy for reading and/or psychological problems consequent upon mixed or conflicting dominances, and also playable as a game, comprising an inclined track having a centrally located upper starting point and a pair of substantially identical loop portions to opposite sides of said starting point, a missile such as a ball to be placed on said starting point for gravitational movement downwardly over said track, impelling means on each of said loop portions movable to alter the speed of the missile and means adjacent said starting point for manually actuating said impelling means.

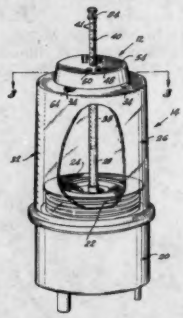
3,559,638
RESPIRATION METER HAVING SEVERAL MODES OF OPERATION
James A. Potter, 12 Greenhouse Blvd., West Hartford, Conn.
Filed Sept. 19, 1967, Ser. No. 668,917
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **9 Claims**

A respiration meter has the following modes of operation: instantaneous air flowrate; minute volume; cumulative volume; tidal volume; and breathing frequency. A selector switch directs an electrical signal indicative of instantaneous air flow along any of the plurality of electrical paths providing such modes of operation. A patient's breath is exhaled



through a chamber in which it creates a pressure attributable to a restricted orifice, which pressure actuates an elastic diaphragm and an arm of a transducer producing such electrical signal.

3,559,639
SPIROMETER MONITORING DEVICE
Wilfred Nagus and Steven A. Bell, Santa Monica, Calif., assignors to Puritan-Bennett Corporation, Kansas City, Mo., a corporation of Missouri
Filed Aug. 5, 1968, Ser. No. 750,258
Int. Cl. A61b *5/08, 7/00*
U.S. Cl. 128—2.08 **15 Claims**

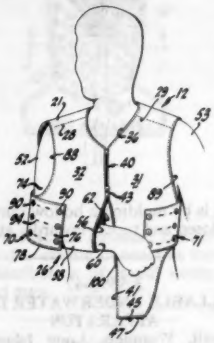


A monitoring device for attachment to a spirometer with an expansible-contractable bellows to provide an alarm signal when indicated respiration ceases for a predetermined time period or when the tidal volume goes below a certain minimum for the same predetermined time period. An electronic audible-alarm signal generator is maintained in an inactive condition by a resettable time delay network. A magnet movable with the bellows actuates a reed switch in the monitor to generate a reset signal to reset the time delay network. If the time delay network is not reset within the predetermined time period by appropriate movement of the bellows and magnet, the alarm signal generator is activated. An auxiliary, inhibit network is provided for deactivating the monitor for a longer predetermined time period when initially turned on after which the monitor automatically resumes its monitoring function. The auxiliary inhibit network and time delay network may be selectively overridden by a manually operated override circuit.

ERRATUM

For Class 128—66 see:
Patent No. 3,559,634

3,559,640
DOUBLE ARM-SLING JACKET
Orval D. Beckett, Rte. 1, Box 1719, Placerville, Calif. 95667
Filed Oct. 16, 1968, Ser. No. 768,138
Int. Cl. A61f *5/40*; A41d *3/02*
U.S. Cl. 128—94 1 Claim

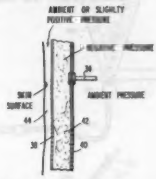


A piece of washable fabric material is formed into a jacket-like garment which is roughly X-shaped in developed condition, the center portion of the device forming a combined back panel and shoulder yoke. A pair of diverging wing panels depends from the shoulder yoke to form a pair of front panels when worn by the user, each of the wing panels including cooperating fasteners to shape the wing panels into forearm supporting pouches. A pair of flaps extending laterally from the back panel is flexed around the adjacent elbow and upper arm portion of the wearer and selectively secured to the front panel to afford a snug fit for the elbow and upper arm. A central zipper selectively joins together the facing front edges of the wing panels and can be used to enclose completely the wearer's forearms.

3,559,641
INTRAUTERINE DEVICE
Coy L. Lay, Lakeland, Fla., assignor to Inutcodes, Inc., Jacksonville, Fla., a corporation of Florida
Filed Sept. 30, 1968, Ser. No. 763,649
Int. Cl. A61f *5/46*
U.S. Cl. 128—130 7 Claims

An intrauterine contraceptive appliance formed of a section of fine mesh made of materials which are inert and immune to chemical and physical changes in the human body. The mesh section has resiliency and is retained in the uterine cavity by friction.

3,559,642
PROTECTIVE SUIT
Charles D. Cupp, Lancaster, N.Y., assignor to "Automatic" Sprinkler Corporation of America, Cleveland, Ohio
Filed Mar. 1, 1968, Ser. No. 709,727
Int. Cl. A41d *13/00*; A62b *7/00*
U.S. Cl. 128—142.5 9 Claims



A life supporting protective suit having inner and outer walls and an intervening layer of porous material forming an isolation chamber between the walls. The isolation chamber is connected to an exhaust system discharging externally of the ambient atmosphere.

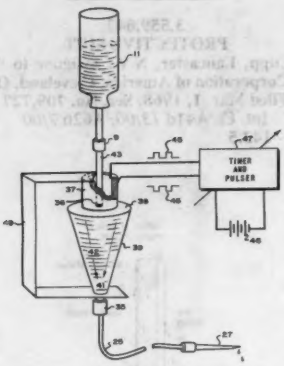
3,559,643
CATHETER PLACEMENT UNIT
Karl A. Pannier, Jr. and James L. Sorenson, Salt Lake City, Utah, assignors to Levoy's, Inc., Salt Lake City, Utah, a corporation of Utah
Filed June 12, 1968, Ser. No. 736,423
Int. Cl. A61m *5/00*
U.S. Cl. 128—214.4 5 Claims

A catheter placement unit for the sterile insertion of a catheter into a body lumen through an incised opening in the lumen wall for parenteral infusion and other purposes, the unit having no cannulated needle, and embodying a longitudinally slit sheath with a catheter therein and an advancer connected to one end of the catheter and initially in axial alignment with said sheath to close an end thereof, the other end of said sheath being initially capped.

3,559,644
LIQUID INFUSION APPARATUS
Paul E. Stoft, Menlo Park, and Robert F. Shaw, 350 Darnassus, San Francisco, Calif. 94117; said Stoft assignor by mesne assignments to said Shaw
Filed Dec. 14, 1967, Ser. No. 690,440
Int. Cl. A61m *5/00*
U.S. Cl. 128—214 4 Claims

Liquid infusion apparatus provides reliable administration of liquids and blood transfusions into the body (intravenous, intraarterial or subcutaneous) at a preset and regulated rate in a convenient, inexpensive and completely safe manner.

The apparatus includes liquid pumping and valving mechanisms and gas relief means which prevent both the



back flow of liquid into the liquid reservoir and the injection of air into the blood stream of the patient.

3,559,645
DISPOSABLE SYRINGE

Kathryn C. Schaller, 20301 Lorne St., Canoga Park, Calif. 91306

Filed July 1, 1968, Ser. No. 741,426
Int. Cl. A61m *5/18*
U.S. Cl. 128—216 6 Claims

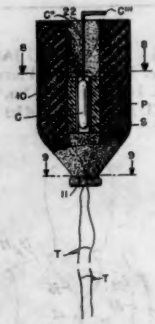
A syringe contains a premeasured amount of medication in a hermetically sealed syringe which has a stiletto inserted in the needle and retained in the cap of the syringe, thereby being removed from the needle as the cap is removed.

3,559,646
TAMPON

Joseph Mullan, 217 Northway, Baltimore, Md. 21218

Filed Aug. 16, 1968, Ser. No. 763,046
Int. Cl. A61f *13/20*
U.S. Cl. 128—270 8 Claims

A device in the nature of a tampon, particularly suited for vaginal and rectal use, having a body of compressible spongy adsorptive and/or absorbent material, the body being hollow, closed at one end and tapered inwardly toward the closed end. The compressible body is held in radially compressed condition in a telescoping tubular applicator or inserting device. One method of making the device comprises the forming of the hollow compressible body by stamping the tampon from suitable stock and later closing one end thereof.

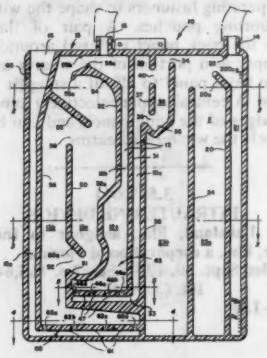


Another method is by molding a hollow tampon in which the hollow body is closed and tapers inwardly at one end thereof.

3,559,647
CONTROLLABLE UNDERWATER DRAINAGE APPARATUS

Robert E. Bidwell, Wantagh, Long Island, N.Y., Sidney Mishkin, Roslyn, Long Island, N.Y., Leonard D. Kurtz, Woodmere, and Edward J. Hallstein, Smithtown, N.Y.; said Bidwell and said Mishkin assignors to Deknatel, Inc., Queens Village, Long Island, N.Y.

Filed June 5, 1968, Ser. No. 734,645
Int. Cl. A61m *1/00*
U.S. Cl. 128—276 38 Claims



An underwater drainage apparatus of the type having integrally formed therein a trap chamber and an underwater seal chamber and also a pressure regulating manometer chamber. A baffle arrangement is provided for preventing loss of liquid from the underwater seal chamber and/or the pressure regulator chamber; and a fluid flow meter is provided for measuring air flow through the underwater seal chamber and/or through the pressure regulator chamber. A special pediatric compartment is formed in the trap chamber.

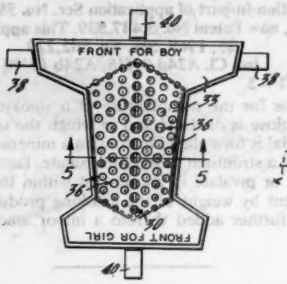
3,559,648
DISPOSABLE DIAPER

Stanley I. Mason, Jr., Weston, Conn., assignor to American Can Company, New York, N.Y., a corporation of New Jersey

Filed Mar. 7, 1969, Ser. No. 805,297
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 8 Claims

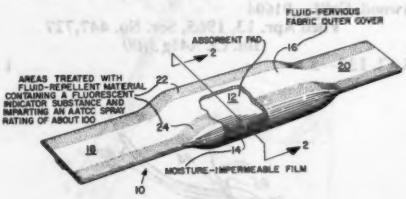
A contoured disposable diaper having a greater concentration of absorptive cellulose fiber material toward one end

and thereby adapted for maximum absorptive capacity in use on both male and female infants by end for end reversal of the diaper for strategic location of the more absorptive area as dictated by the sex of the infant. The liner is preferably



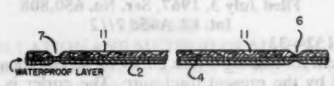
apertured for more efficient moisture reduction of semisolid waste materials and a central channel in the absorptive pad promotes even distribution of liquid waste for absorption throughout the pad area.

3,559,649
SANITARY NAPKIN
Martin Grad, Cincinnati, and Darrel D. Kokx, Greenhills, Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio, a corporation of Ohio
Filed Dec. 20, 1967, Ser. No. 692,003
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 **1 Claim**


FLUID-PERVIOUS FABRIC OUTER COVER
ABSORBENT PAD
AREAS TREATED WITH FLUID-REPELLENT MATERIAL CONTAINING A FLUORESCENT INDICATOR SUBSTANCE AND IMPARTING AN AATCC SPRAY RATING OF ABOUT 100
MOISTURE-IMPERMEABLE FILM

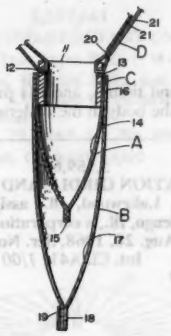
A sanitary napkin comprising an absorbent pad enwrapped by a fluid pervious outer cover treated with a fluid-repellent material along areas overlying the side edges and side marginal portions of the top face of the pad, the treated areas being permeable to air. The fluid-repellent treatment material contains a fluorescent indicator substance and imparts an AATCC spray rating of about 100 to the treated areas.

3,559,650
FLUSHABLE MOISTURE-RETAINING SANITARY PAD
Phyllis M. Larson, 1412 Julie Ave., McLean, Va. 22101
Filed Dec. 19, 1967, Ser. No. 691,769
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 **3 Claims**



A disposable sanitary pad or napkin having a flush-disposable absorbent pad on the upper side and a flush-disposable backing of paper or similar material, with a thin flexible layer of liquid-retarding material (such as a greasy or waxlike material) between the two, so that liquid from the pad cannot reach the backing to dissolve it, but liquid reaching the backing from its exposed side will disintegrate it so that it can be disposed of by flushing in a toilet, the thin layer being unable to remain as a film without the support of the backing material, so that it also disintegrates when the backing material disintegrates.

3,559,651
BODY-WORN ALL DISPOSABLE URINAL
David H. Moss, 6800 Indian Creek Drive, Miami Beach, Fla.
Filed Oct. 14, 1968, Ser. No. 767,129
Int. Cl. A61f *5/44*
U.S. Cl. 128—295 **1 Claim**



A body-worn and all disposable urinal having a collar for receiving a male organ, a plurality of telescopically mounted bags having open ends secured to the collar, the outer bag having a sealed chamber for containing urine and the inner bag having an opening for urine to be discharged to the outer bag, the collar having a pair of opposed openings for receiving a length of pliable material that encircles the person's waist and fastens the collar in position on the person's body.

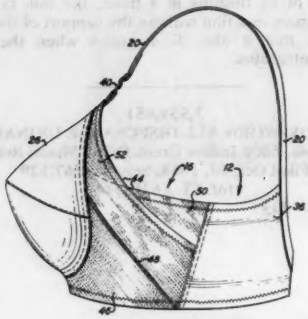
3,559,652
METHOD OF ADHESIVELY REPAIRING BODY TISSUE WITH ALKOXYALKYL 2-CYANOACRYLATE
Elden H. Banitt and Robert A. Nelson, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware
No Drawing. Filed Aug. 5, 1968, Ser. No. 749,996
Int. Cl. A61b *17/04*
U.S. Cl. 128—334 **15 Claims**

The invention relates to a method for surgically adhering living tissues and effecting hemostasis therein by means of a rapidly polymerizing composition which comprises alkoxyalkyl 2-cyanoacrylates.

3,559,653
BRASSIERE SIDE CONSTRUCTION
Edward Jannicelli, Jr., Ramsey, N.J., assignor to International Playtex Corporation, Dover, Del., a corporation of Delaware
Filed Sept. 21, 1967, Ser. No. 669,469
Int. Cl. A41c *3/00*
U.S. Cl. 128—498 **12 Claims**

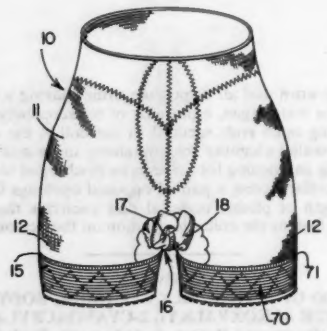
Brassiere having novel overlapping side constructions that, inter alia, (1) firmly hold and compress the pectoral muscles

and the adipose tissues associated therewith without discomfort to the wearer during use, (2) prevent unsightly bulging



of such muscles and tissues, and (3) provide a smooth contour or profile of the body in the underarm region.

3,559,654
COMBINATION GIRDLE AND STOCKINGS
Henry Pope, Jr., Lakewood, Ill., assignor to Bear Brand Hosiery Co, Chicago, Ill., a corporation of Illinois
Filed Aug. 28, 1968, Ser. No. 756,000
Int. Cl. A41c *1/00*
U.S. Cl. 128—519 **7 Claims**



A ladies undergarment and stockings, the undergarment including stomach and buttocks surrounding portions and having downwardly directed leg portions with bottom extremities, each of the bottom extremities carrying a nonslip fabric band thereon for supporting the thigh engaging portion of an associated ladies stocking. Each of the nonslip fabric bands comprises a longitudinally elastic textile material having a layer of frictional material laminated thereto and exposed on the inside surface of the band. Each of the stockings has a thigh engaging portion formed of a high-stretch yarn. The stockings are positionable so that the thigh engaging portions thereof are disposed under the nonslip fabric bands of the undergarment, whereby the frictional material exposed on the inside surfaces of the bands of the undergarment engage the thigh engaging portions of the stockings so as to detachably secure the stockings to the undergarment.

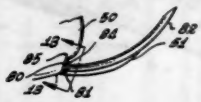
3,559,655
OXIDIZED CELLULOSE SUBSTITUTE SMOKING MATERIAL AND METHOD OF MAKING SAME
Theodore S. Briskin and Geoffrey R. Ward, Beverly Hills, Calif., assignors to Sutton Research Corporation, Los Angeles, Calif., a corporation of Delaware
Continuation-in-part of application Ser. No. 595,622, Nov. 21, 1966, now Patent No. 3,447,539. This application Feb. 25, 1969, Ser. No. 802,229
Int. Cl. A24d *01/18;* A24b *15/00*
U.S. Cl. 131—2 **8 Claims**

A process for the manufacture of a smoking product in which cellulose is oxidized and in which the oxidized cellulosic material is formulated to contain a mineralizing agent in the form of a strontium or barium oxalate, lactate, glycolate, diglycolate or pivalate in an amount within the range of 5—40 percent by weight of the smoking product and which may have further added thereto a minor amount of oxalic acid.

3,559,656
TOBACCO PRODUCT
Robert A. Heckman, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C., a corporation of New Jersey
Filed Apr. 28, 1969, Ser. No. 819,951
Int. Cl. A24b *15/00*
U.S. Cl. 131—17 **10 Claims**

Flavoring of tobacco products by incorporating therewith a small amount of a chemical compound selected from 1-oxa-8-oxo-2,6,10,10-tetramethyl-spiro[4,5]-6-decene and 4-(1-hydroxy-4-keto-2,6,6-trimethyl-2-cyclohexen-1-yl)-butan-2-ol.

3,559,657
FALSE EYELASHES AND METHOD OF MAKING THE SAME
Robert Gordon Bau, 3271 Laurel Canyon Blvd., North Hollywood, Calif. 91604
Filed Apr. 13, 1965, Ser. No. 447,727
Int. Cl. A41g *3/00*
U.S. Cl. 132—5 **1 Claim**

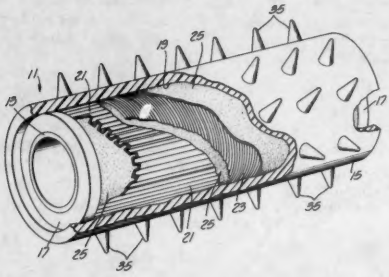


A molded plastic false eyelash having a base strip releasably attached to an eyelid, and a plurality of elongated generally parallel strands of plastic material simulating natural eyelashes and each integrally joined to one side of the base strip. The base strip having a cross section in the shape of a truncated rectangle with projections assisting in holding the strip in place.

3,559,658
HAIR CURLING SYSTEM
Leonard J. Genest and Arnold I. Klayman, Marina Del Rey, Calif., assignors to Marina Research, Inc.
Filed July 3, 1967, Ser. No. 650,808
Int. Cl. A45d *2/12*
U.S. Cl. 132—33 **1 Claim**

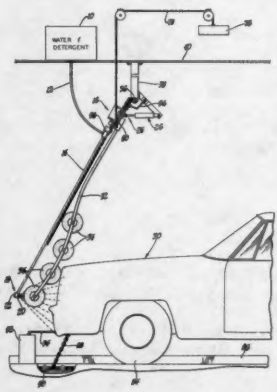
A system for heating a hair curler by an electrical device is provided by the present disclosure. The curler is a double-walled roller container filled with a heat-absorbing material and a thermal-conducting material, and the heating device utilizes the principle of resistance heating to rapidly heat the heat-absorbing material until it melts. A temperature sensor automatically turns off the heating device when the curler is sufficiently heated. The curler retains the heat for a relatively

long time because of the heat of fusion involved in the transition of state from liquid to solid. The shaping and setting of



the hair is accomplished largely as a result of the heat applied during the reshaping of the hair.

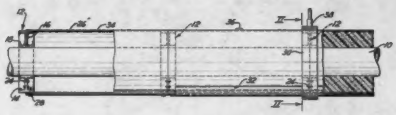
3,559,659
VEHICLE CLEANING APPARATUS
Harry K. Gougoulas, 1875 Philomine, Lincoln Park, Mich.
Filed July 31, 1968, Ser. No. 749,125
Int. Cl. B60s *3/04*
U.S. Cl. 134—45 **34 Claims**



Vehicle cleaning apparatus including a selectively operable nozzle adapted to provide a high-pressure stream of cleaning fluid to a vehicle's outer surface and a motor for oscillating said nozzle in a longitudinal direction with respect to the vehicle. The nozzle apparatus takes several forms including a nozzle pivotally supported overhead but movable rectilinearly with respect to the longitudinal axis of the vehicle. In another form a plurality of nozzles are pivotally supported overhead of a vehicle, the support being movable rectilinearly with respect to the longitudinal axis of the vehicle so as to provide a high-pressure cleaning fluid spray to all portions of the top of the vehicle.

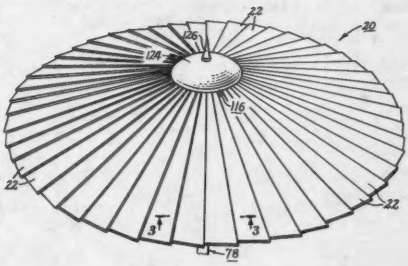
3,559,660
PIPE INSULATION AND METHOD OF MAKING SAME
Carl L. Rollins, Tulsa, Okla., assignor to Warren Petroleum Corporation, Tulsa, Okla., a corporation of Delaware
Filed Aug. 28, 1968, Ser. No. 755,893
Int. Cl. F16l *59/12*
U.S. Cl. 138—149 **3 Claims**

A method and apparatus for insulating pipes in which annular spacers are secured to the pipe along its length. Sheet metal covers encircling the pipe are secured to the spacers and supported by the spacers at the distance required for insulation of the desired thickness. Liquids capable of reacting



rapidly to form a solid foam of excellent insulating characteristics are injected into the annular space between the pipe and the sheet metal cover to fill that space with the foam insulation material.

3,559,661
FOLDABLE WIND-RESISTANT UMBRELLA
John D. O'Rear, Bee Tree Farm RFD-1, Woodstock, Vt.; Edward A. Hanselman, Hodsick Falls, and Kenneth O. Gifford, Eagle Bridge, N.Y.; said Hanselman and said Gifford assignors to said O'Rear
Filed Sept. 29, 1969, Ser. No. 861,811
Int. Cl. A45b *19/00*
U.S. Cl. 135—20 **11 Claims**

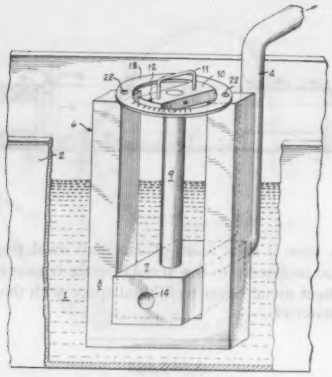


A foldable wind-resistant umbrella having a top formed from a plurality of separate vanes which can lift to dissipate wind forces. The vanes are mounted over a collapsible frame which permits the umbrella to be folded. The umbrella may be rotatably supported on a pole to enhance its wind dissipating characteristics and may also be provided with interchangeable decorative caps to permit its use in varied decorative schemes.

3,559,662
METHOD AND VALVE APPARATUS FOR METERING THE FLOW OF LIQUID METAL
Robert A. Iezzi, Kent, Ohio, and Laszlo V. Sandor, Cleveland Heights, Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio, a corporation of New Jersey
Filed Nov. 25, 1968, Ser. No. 778,609
Int. Cl. F27d *3/14*; **F16k** *5/04*
U.S. Cl. 137—1 **10 Claims**

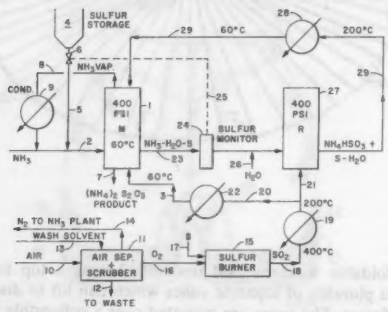
A method and means for metering the flow of liquid zinc between a reservoir and a vacuum chamber in a vapor deposition process, comprising a valve body and operator structure composed of graphite which is immersed in the liquid zinc in the reservoir so that the body of zinc acts as an

atmosphere-to-vacuum seal, and as a result of the nonwetting of graphite by zinc at the operating temperatures of the



deposition process a liquid-to-liquid seal is also achieved within the valve structure.

3,559,663
METHOD FOR CONTROLLING SULFUR CONCENTRATION IN AMMONIA
Richard L. Every, Ponca City, Okla., and Paul F. Cox, Richardson, Tex., assignors to Continental Oil Company, Ponca City, Okla., a corporation of Delaware
Original application Oct. 12, 1966, Ser. No. 586,189. Divided and this application Nov. 25, 1969, Ser. No. 879,670
Int. Cl. C01b *17/64*
U.S. Cl. 137—5 **3 Claims**



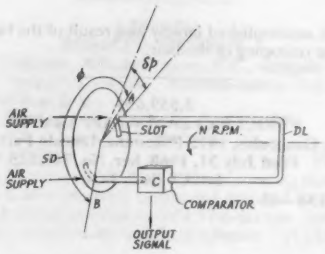
It is disclosed that the conductivity of a sulfur in ammonia solution is a measure of the sulfur concentration and that sulfur in ammonia solution of predetermined concentration can be continuously prepared by monitoring the conductivity of such solution and controlling at least one feed stream responsive to such monitoring.

3,559,664
PROCESS OF REDUCING FRICTION LOSS IN FLOWING HYDROCARBON LIQUIDS
Errol V. Seymour, Houston, Tex., and DeLoss E. Winkler, Orinda, Calif., assignors to Shell Oil Company, New York, N.Y., a corporation of Delaware
Filed Sept. 28, 1967, Ser. No. 671,221
Int. Cl. F17d *1/16*
U.S. Cl. 137—13 **3 Claims**

A method of reducing friction during flow of hydrocarbon liquids through conduits by addition to the liquids of a small amount of a copolymer of ethylenepropylene.

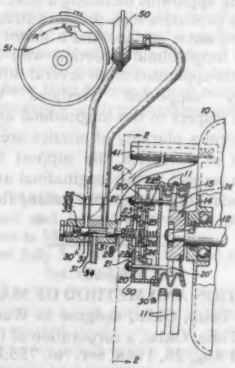
This invention relates to a method of decreasing friction loss in flowing hydrocarbon liquids through conduits, generally over great distances but also over short distances such as in well fracturing processes. More particularly, the invention is directed to the addition of a novel class of ethylenepropylene copolymers to hydrocarbon liquids such as crude oil and fractions thereof, so as to reduce its friction loss due to flow through pipelines over great distances and short distances.

3,559,665
CONTROL SYSTEMS
John Christopher Hammond Davis and Guy Edward Davies, Taplow, England, assignors to British Telecommunications Research Limited, Taplow, England, a British company
Filed Nov. 12, 1968, Ser. No. 775,066
Int. Cl. F16k *17/36*
U.S. Cl. 137—39 **9 Claims**



A control system for exercising a control in dependence upon the function $\frac{N}{\sqrt{T}}$ where N is a rotational speed and T is a fluid temperature in which first and second pulses are produced whose timing is dependent on the rotational speed. The first pulse is transmitted through a delay line containing fluid at the temperature T and compared in a comparator with the second pulses. The output from the comparator is used as a feedback signal to bring the two pulses into coincidence.

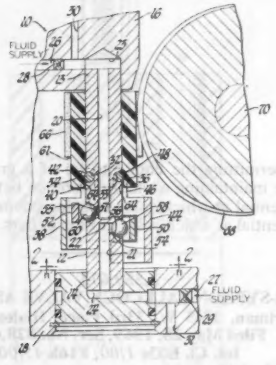
3,559,666
GOVERNOR MOUNTED IN A GENERATOR
Brooks Walker, and Frank W. Kertell, 1280 Columbus Ave., San Francisco, Calif. 94133
Continuation of application Ser. No. 648,085, June 22, 1967, now abandoned. This application Aug. 18, 1969, Ser. No. 853,589
Int. Cl. G05d *13/10*
U.S. Cl. 137—53 **10 Claims**



This invention involves a governor mounted in the pulley of an automotive generator by a very simple adapter to make

use of the bearings of the generator to support the governor. The governor has the characteristic of retracting a friction resistant plunger such as Teflon at all speeds below a selected speed to be used to operate a valve to control a suction operated motor to actuate fuel shut off above said selected speed at closed throttle or to actuate a suction operated spark advance mechanism or other engine functions requiring a speed sensor.

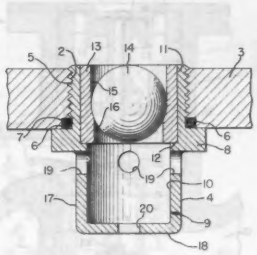
3,559,667
GOVERNOR
Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, a corporation of Delaware
Filed Dec. 11, 1968, Ser. No. 782,943
Int. Cl. G05d *13/10*
U.S. Cl. 137—54 **14 Claims**



A governor control valve wherein governor outlet pressure is regulated by exhausting fluid from an exhaust port in response to changes in centrifugal force based on vehicular speed changes. The device includes a shaft having a restricted main line pressure inlet, a governor pressure outlet and an exhaust port formed therein and an axial passage therebetween. A cylindrical pin mounted on the shaft supports both a concentric drive gear and one or more weight members suspended from the pin and transmits the torque from the drive gear to the shaft. One embodiment provides two separate governors in one assembly, one with a slow rising pressure curve, the other with a fast rising pressure curve. Another embodiment thereof provides a two-stage governor pressure vs. speed relationship. The first embodiment of the valve assembly consists of dual inlet, outlet and exhaust ports and passages, with a relief valve for each exhaust port, and two weights having different sizes and shapes suspended from two pins for respectively variably controlling the fluid exhaust through the exhaust ports past the relief valves, in response to centrifugal force. The second embodiment of the valve assembly consists of a single inlet and governor pressure outlet arrangement wherein fluid exhaust is controlled by one ball relief valve which is actuated by two different weight members suspended from one pin, the lighter weight member being in direct contact with the valve while the heavier weight member influences the lighter member through a spring until the heavier member contacts a stop.

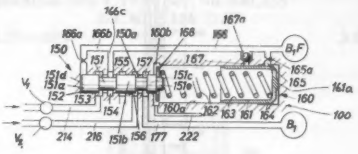
3,559,668
SAFETY VALVE
Richard L. Crossman, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio, a corporation of Ohio
Filed Mar. 4, 1969, Ser. No. 804,167
Int. Cl. F16k *17/38*
U.S. Cl. 137—73 **5 Claims**

A safety valve for use on a tire or other pressure chamber to release internal pressure in the event of excessive pressure or temperature within the chamber. The present embodiments show a cylindrical hollow housing threaded into a wheel rim. A cylindrical sleeve of eutectic material is positioned in the center bore of the housing and carries a ball or disc which retains the pressure within a tire mounted on the wheel. When the pressure or temperature of the tire reaches



a certain predetermined safe maximum, the eutectic sleeve will either melt and release the pressure retaining ball or disc, or due to the softness of the sleeve, will permit the ball or disc to be forced outwardly from the sleeve when the internal pressure reaches a certain predetermined maximum.

3,559,669
HYDRAULIC CONTROL SYSTEM FOR BRAKES, CLUTCHES AND THE LIKE
Hansjorg Dach, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany, a corporation of Germany
Filed Dec. 20, 1968, Ser. No. 785,687
Claims priority, application Germany, Dec. 22, 1967, 1,655,948
Int. Cl. F16h *57/19*; **G05g** *9/12*
U.S. Cl. 137—102 **7 Claims**

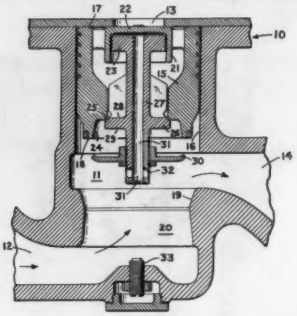


A pair of hydraulic loads in the form of clutches and/or brakes are controlled by a common valve having separate inlet ports for high-pressure fluid and associated outlet ports respectively connected to these loads, each inlet port communicating with its associated outlet port in an initial position of a slider which, in response to pressure buildup in the first outlet port, shifts into an alternate position in which the fluid supply to the first load is reduced and the supply to the second load is substantially cutoff, this shift occurring against a biasing force of a spring bearing upon a piston which is displaceable by hydraulic fluid from the first outlet port, delivered through a constricted passage, to augment the biasing force so as to reestablish the initial position after a further pressure rise at the first load, thereby admitting fluid to both loads at substantially the pressure prevailing at the two inlet ports.

3,559,670
FLUID FLOW RATE ACTUATED CHANGE OVER VALVE
Shmariahu Yedidiah, West Orange, N.J., assignor to Gamon-Calmet Industries, Inc., Newark, N.J., a corporation of Delaware
Filed Jan. 14, 1969, Ser. No. 791,015
Int. Cl. G05d *7/01*
U.S. Cl. 137—110 **16 Claims**

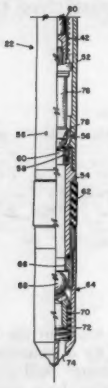
A fluid flow rate actuated change over valve having one in-

let, two outlets and a valve mechanism sensitive to the rate of fluid flow through the valve such that the discharge flow is



directed into a low flow rate line or a high flow rate line dependent upon the rate of fluid flow.

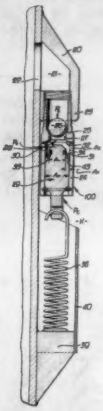
3,559,671
GAS LIFT VALVE
Bobby L. Douglas, Ennis, Tex., assignor to Dresser Industries, Inc., Dallas, Tex., a corporation of Delaware
Filed Aug. 26, 1968, Ser. No. 755,364
Int. Cl. F04f *1/08*
U.S. Cl. 137—155 **6 Claims**



A gas lift valve that is connected in a tubing string and disposed in a cased well bore. The gas lift valve provides communication between the casing and tubing whereby gas in the annular space therebetween can be injected into the tubing to aid in producing oil from the well. The gas lift valve includes a valve member that is responsive to pressure within the tubing for movement between open and closed positions to control the flow of gas into the tubing.

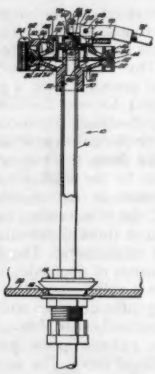
3,559,672
DIFFERENTIAL PRESSURE GAS LIFT VALVE
David V. Chenoweth, Houston, Tex., assignor to Baker Oil Tools, Inc., Commerce, Calif., a corporation of California
Filed Oct. 3, 1968, Ser. No. 764,738
Int. Cl. F04f *1/08*
U.S. Cl. 137—155 **9 Claims**

A subsurface well gas lift valve for incorporation in a tubing string disposed in a well bore and having a gas inlet choke or orifice for gas supplied through the well casing and an outlet into the tubing string, a piston valve being shiftable between open and closed positions to control gas flow between the inlet and outlet, the piston valve having a greater effective area subject to gas pressure on the downstream side of the inlet choke when in open position than its area subject to the tubing pressure when in closed



position, permitting the choke to be of a greatly increased area, while maintaining a small difference between the pressure differential at which valve opening occurs and the pressure differential at which valve closing occurs.

3,559,673
ANTI-SYPHON BALLCOCK VALVE ASSEMBLY
Milton Perlman, 1745 W. 33rd Place, Hialeah, Fla. 33012
Filed May 28, 1969, Ser. No. 828,491
Int. Cl. E03c *1/00*; F16k *45/00*
U.S. Cl. 137—218 **8 Claims**



A plastic antisyphon, ballcock valve assembly in which an axial water pressure inlet includes an upper valve seat engageable by a shutoff washer operated by a plunger and float-ball operated lever which includes an adjusting screw to control the water level in a flush tank or the like, and in which a peripherally sealed diaphragm includes a free inner edge surrounding the valve seat and is urged into sealing relationship with respect to air-introducing apertures when the sealing washer is unseated and water is directed in a circuitous path to an outlet conduit including branch ducts respectively connected to a hush pipe and flush tank stand pipe, and in which an adjustable screw is interposed at the branch ducts to divide the water flow through the hush pipe and stand pipe conduits to balance and substantially diminish sounds emitted as water is discharged therefrom; and in which substantially all of the working components of the antisyphon ballcock valve assembly are immediately adjacent to the upper portion of a flush tank providing ready access for

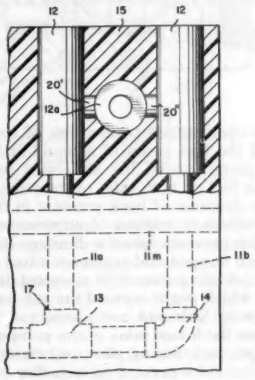
maintenance, replacement and repair and in which an extremely high "critical level" is provided whereby danger of syphoning is obviated and substantially eliminated, and the flush tank can be maintained at a minimum height.

3,559,674

MOUNTING PLATE FOR HYDRAULIC INSTALLATIONS AND METHOD OF MAKING SAME

Fritz Ostwald, Buchschlag, and Gerhard Nonn, Hofheim Taunds, Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Germany, a corporation of Germany

Filed Sept. 25, 1968, Ser. No. 762,406
Claims priority, application Germany, Oct. 2, 1967, T34929/67
Int. Cl. F161 *39/00*
U.S. Cl. 137—375 **9 Claims**



A mounting plate for hydraulic installations, such as hydraulic reservoirs, pumps, motors, control valves and servomechanisms, wherein a network of fittings and ducts is initially formed by soldering tubular conduits to cast or forged fittings (adapted to be threadedly connected to the hydraulic devices). The network is thereafter cast in a synthetic resin, usually a polyester, such that the fittings are flush with the surface of the resin and the latter fills the interstices between the fittings and the ducts to cushion the latter and resiliently damp vibration and noise.

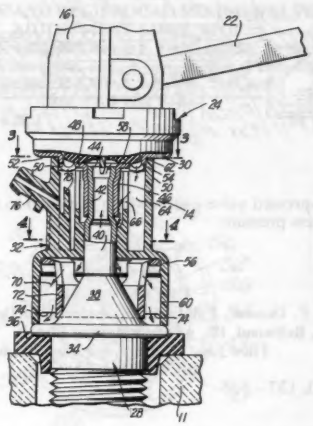
3,559,675

FLUID FLOW PASSAGE AND VALVE ASSEMBLY FOR BALL COCKS

Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631, and Fredric E. Schmuck, 535 Century Drive, Anaheim, Calif.

Filed Mar. 20, 1969, Ser. No. 808,853
Int. Cl. F16r *31/14*
U.S. Cl. 137—436 **3 Claims**

A water inlet member is secured extending upwardly into a water tank and is telescoped by a water outlet member with a valve assembly secured to the inlet member and overlying an upper edge of the outlet member providing valve control communication between the inlet member and interiorly of the outlet member. During assembly, a valve housing member is pressed onto the inlet member and simultaneously tightly engages a thin, continuously circular upper edge of the outlet member sealing therebetween. The outlet member includes an angularly upwardly extending refill hose connection spaced downwardly from the outlet member upper edge and above main water outlet openings, a series of spaced fingers being positioned filtering water passing out the refill hose connection. A guide on the valve assembly mounts a



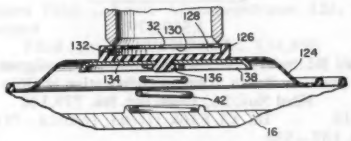
float controlling the valve operation and a refill hose extends from the refill hose connection upwardly into a refill tube.

3,559,676

ANTIHUNTING DIAPHRAGM VALVES

Lauren D. Haskins, Long Beach, Calif., assignor to Robertshaw Controls Company, Richmond, Va., a corporation of Delaware

Original application Dec. 19, 1966, Ser. No. 602,853, now Patent No. 3,468,511, dated Sept. 23, 1969. Divided and this application July 9, 1969, Ser. No. 840,235
Int. Cl. F16k *7/17*
U.S. Cl. 137—489 **3 Claims**



A diaphragm-type valve member for a pressure regulator movable relative to a fixed valve seat for regulating the pressure of a fluid flow therethrough in order to maintain delivery of the fluid flow at a constant pressure. A central portion of the valve member is integrally formed with the diaphragm to define an internal cavity under its seating contact portion to stabilize the movement of the diaphragm valve element and eliminate hunting or oscillation thereof at low pressure ranges.

3,559,677

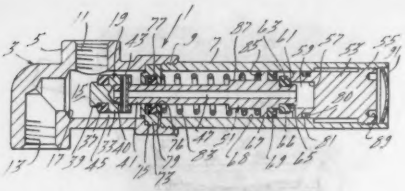
OVERLOAD CONTROL VALVE

John M. Barosko, Kenosha, Wis., assignor, to Tenneco Inc., Houston, Tex., a corporation of Delaware, by mesne assignments

Filed May 28, 1969, Ser. No. 828,470
Int. Cl. F16k *31/143*
U.S. Cl. 137—505.13 **10 Claims**

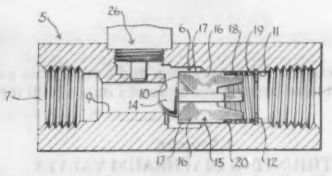
A valve for controlling the maximum pressure of gas in a

system has a control chamber which senses pressure in the system through an aperture that extends lengthwise of a



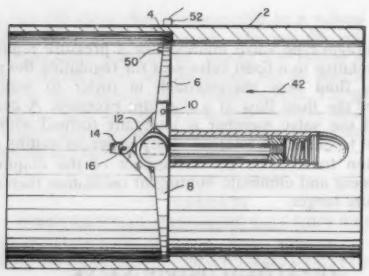
spring-pressed valve-piston which is moved to cutoff position by excess pressure.

3,559,678
CHECK VALVE
Verne P. Donner, Palatine, Ill., assignor to Deltrol Corporation, Bellwood, Ill., a corporation of Illinois
Filed Jan. 21, 1969, Ser. No. 792,638
Int. Cl. F16k *15/04*
U.S. Cl. 137—535 **1 Claim**



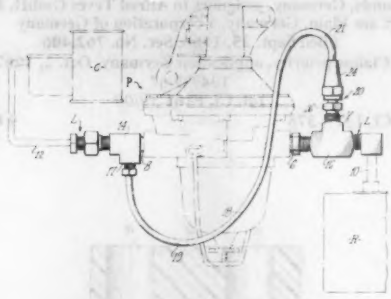
A check valve having an elongated body accurately guided for lengthwise back and forth motion in a valve chamber by substantially thin longitudinal vanes joined to one another at a narrow zone along the axis of the body. The body can have a coaxial hemispherical seat engaging protuberance integrally joined to the forward edges of the vanes, or alternatively, the forward edges of the vanes can be formed with a hemispherical concavity to receive a seat engaging sphere.

3,559,679
HINGE VALVE
Johannes R. Smirra, Stuttgberg, Germany, assignor to TRW Inc., Redondo Beach, Calif., a corporation of Ohio
Filed Nov. 26, 1968, Ser. No. 779,140
Int. Cl. F16k *31/163, 1/16*
U.S. Cl. 137—554 **3 Claims**



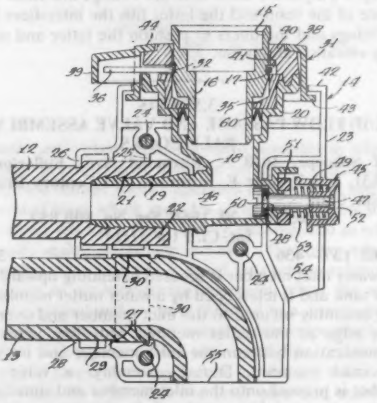
A hinge valve is described which controls fluid flow by means of movable flap sections which are actuated by fluid pressure on associated linkage so as to move from a closed position to an opened position—or vice versa.

3,559,680
FUEL PRESSURE RELIEF ASSEMBLY
Neil C. Norton, Los Angeles County, Calif. (P.O. Box 104, Gardena, Calif. 90247)
Continuation-in-part of application Ser. No. 616,594, Feb. 16, 1967, now abandoned. This application May 3, 1968, Ser. No. 726,308
Int. Cl. F04b *23/00*
U.S. Cl. 137—563 **5 Claims**



A normally-open valved bypass line of small capacity is added around the fuel pump of a liquid-fuel engine. Upon cessation of pump action, the still open bypass equalizes pressure of the fuel on both sides of the pump; then it closes in response to decrease of back pressure in the bypass so as to retain an unbroken column of unpressured liquid in the whole line. This prevents forward drainage into the carburetor of otherwise trapped and pressurized fuel after the pump has stopped, and also prevents its rearward drainage into the fuel reservoir which might occur if the valve remained open. The bypass being S-shaped and connected to pick up the liquid fuel from the lowest level of the pump outlet line, also minimizes vapor lock during pump operation. A ball-check valve also opens the tapered bypass orifice progressively, in proportion to increased back pressure.

3,559,681
FILLING AND DRAIN COUPLER
Wilbur W. Jarvis, St. Joseph, Mich., and Roland E. Nicholson, Hartford, Mich., assignors to Whirlpool Corporation, a corproation of Delaware
Filed June 11, 1969, Ser. No. 832,240
Int. Cl. F16l *39/00*
U.S. Cl. 137—594 **7 Claims**



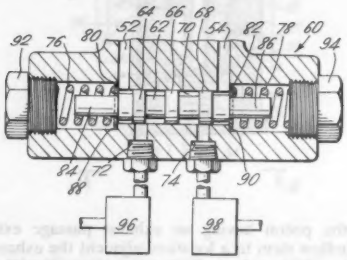
An improved filling and drain coupler for supplying water to and draining water from an appliance and the like in

which the outer casing parts of the coupler serve the dual function of providing a pleasing appearance and also locking the internal operating parts in their proper position so that the entire device is compact, economical and highly reliable.

3,559,682
POWER CLUTCH-OPERATED RATIO-CHANGING MECHANISM FOR HYDRO-MECHANICAL TRANSMISSION SYSTEM

George Sherman Morley, Goderich, Ontario, Canada, assignor to The Dominion Road Machinery Co., Limited, Goderich, Ontario, Canada

Filed Oct. 25, 1968, Ser. No. 770,610
Int. Cl. F16k *11/10*; F15b *11/08*
U.S. Cl. 137—596.15 4 Claims

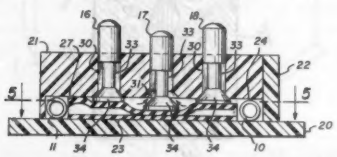


A hydraulic switching mechanism is formed of two cooperating valves, the first being a rotary type which directs fluid under pressure to a second valve of the sliding spool type which has springs at both ends to hold the spool in the neutral position. The rotary-type is formed of a body having a pair of diverging passages connecting through a chamber with an inlet port; a rotary valve member, having a passage therethrough connecting with the inlet port, is located in the chamber and is actuated by a reversible shaft to select the movement of fluid through the valve member into one or other of the diverging passages, these in turn being connected to a respective end of the spool valve thereby moving the spool out of neutral against a respective spring. The spool has a pair of ports which are connected to individual clutches, the actuation of which depends on the selected direction of flow in the switching mechanism.

3,559,683
FLUID CONTROL DEVICE

John Maguire, Littleton, Colo., assignor to Samsonite Corporation, Denver, Colo., a corporation of Colorado

Filed June 12, 1969, Ser. No. 832,620
Int. Cl. F16k *17/04*
U.S. Cl. 137—612.1 6 Claims

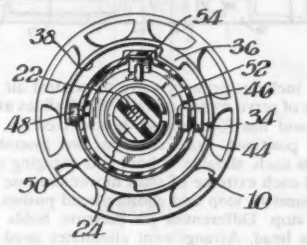


The fluid control device has a closed passage formed by a groove in a block and closed by a base and an end plate, with bores extending downwardly through the block to the channel. An inlet tube and a normal outlet tube is sealed in a port leading to the inlet and outlet ends, respectively, of the passage. A valve is held upwardly against a valve seat of each bore by a resilient tube which avoids the use of normal springs and extends within the passage, being sealed to a neck at the outlet. Control buttons are slidably received in the bores and connected to stems for depressing the respective valves and flatten the tube, which terminates the flow of the normal outlet, the water than flowing around the tube and into the bore whose valve is opened. The block also has ports extending laterally into the bores and in which the ends of alternative outlet tubes are sealed.

3,559,684
ROTATABLE AND RECIPROCAL MIXING VALVE AND ADJUSTMENT LIMIT STOP

Charles J. Rudewick, III, Newark, Del., assignor to Speakman Company, Wilmington, Del., a corporation of Delaware

Filed Oct. 24, 1968, Ser. No. 770,302
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.17 11 Claims

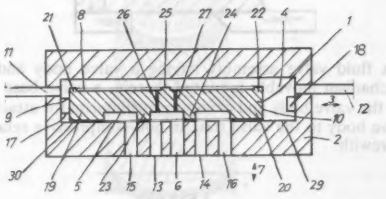


Valve arrangement comprises valve casing with mixing valve therein and valve stem extending outwardly therefrom. Tubular collar fixed to casing surrounds valve stem, and rotatable and reciprocal valve operator is connected to stem for rotating and reciprocating mixing valve relative to casing. Improvement comprises spaced apart fixed stop and readily accessible adjustable stop on tubular collar. Projection on valve operator is positioned between stops and constructed and arranged to engage stops to limit rotation of valve operator. Pin is connected to tubular collar and abutment on valve operator engages pin when operator is moved inwardly toward mixing valve to prevent inward movement of operator at all rotary positions thereof except when projection on operator is near fixed stop on tubular collar.

3,559,685
MULTI-WAY-VALVE

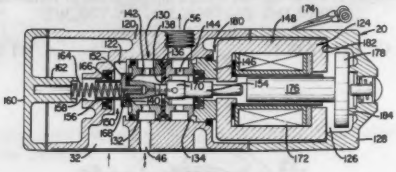
Jan Richard Peter deFries, Allenmoosstrasse 124, Zurich, Switzerland

Filed June 19, 1969, Ser. No. 834,850
Claims priority, application Germany, June 20, 1968, P1,750,933
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.6 21 Claims



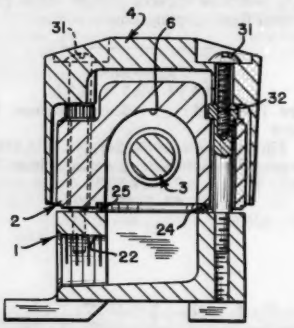
A multiway valve for connecting outlets leading to either end of a hydraulic cylinder, and at the same time connecting the other outlet to a return passage, includes a casing having a control member movable with clearance therein. This control member when shifting from one position to another is lifted up by the pressure of the fluid being controlled, then shifted to a different position, and then restored to sealing position by the application of pressure on its upper side.

3,559,686
FOUR-WAY TWO-POSITION CONTROL VALVE
Robert K. Hoffman, Littleton, Colo., assignor to C.A. Norgren Co., Littleton, Colo., a corporation of Colorado
Filed May 27, 1968, Ser. No. 732,406
Int. Cl. F16k 11/07
U.S. Cl. 137—625.64 16 Claims



System includes primary valve to control air flow to and from ends of servo motor cylinder. Shaft slides axially in bore of valve and has four poppet heads fixed on shaft at appropriate positions. Bore contains two assemblies of two valve seats each, slidable in bore and engaging stops to limit travel. At each extreme of shaft movement one head pushes a seat against its stop and another head pushes a seat away from its stop. Differential air pressure holds second seat against its head. Arrangement eliminates need for extreme accuracy in spacing heads and seats. System also includes pilot valve to control air to and from piston in primary valve which moves poppets. Solenoid armature impact is reduced by spring, air pressure, and seal friction.

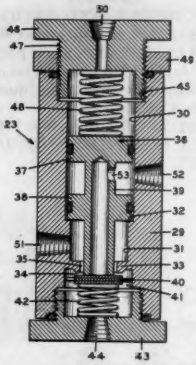
3,559,687
FLUID VALVE CONSTRUCTION
Wilfred Aslan, Mahwah, N.J., assignor to Alkon Products Corporation, Wayne, N.J., a corporation of New York
Filed Apr. 1, 1968, Ser. No. 717,829
Int. Cl. F16k 11/07
U.S. Cl. 137—625.69 14 Claims



A fluid valve assembly having a valve body and valving mechanism movably mounted therein, a valve base supporting the valve body and clamping mechanism for attaching the valve body to the valve base in non-compressive relationship therewith.

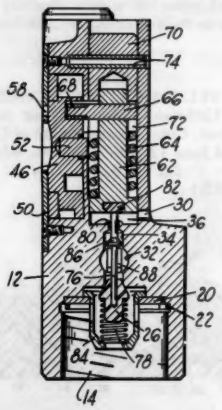
3,559,688
FLUID PRESSURE REGULATING VALVE
Alvin M. Fischer and Harry J. Warmkessel, Allentown, Pa., assignors to Mack Trucks, Inc., Allentown, Pa., a corporation of Delaware
Original application June 4, 1965, Ser. No. 461,394, now Pat. No. 3,442,502, dated May 2, 1969. This application May 5, 1969, Ser. No. 821,812
Int. Cl. F16k 11/10
U.S. Cl. 137—627.5 3 Claims

A fluid pressure regulating valve having a control port, an inlet port, an outlet port and an exhaust port, an inlet valve disposed between the inlet and outlet ports, and a reciprocable piston having a hollow stem extending toward and adapted to engage and open the inlet valve in one position and to disengage the inlet valve to close the same in another



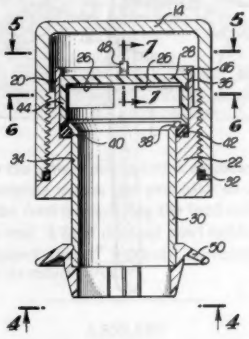
position, the piston having an exhaust passage extending from the hollow stem to a location adjacent the exhaust port which is closed when the hollow stem engages the inlet valve and which is opened when the stem disengages the inlet valve.

3,559,689
20 MAN RAFT CO_2 INFLATION VALVE
Jack Dunbar, Davenport, Iowa, and Donald K. Schlueter, Northridge, Calif., assignors to The Bendix Corporation, a corporation of Delaware
Filed July 14, 1969, Ser. No. 841,490
Int. Cl. F16k 11/10
U.S. Cl. 137—627.5 10 Claims



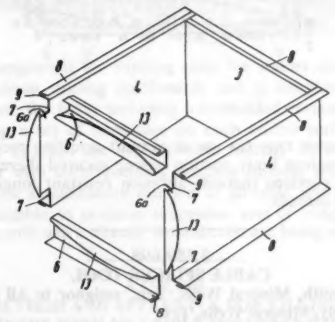
The following relates to a fluid pressure distributing mechanism for inflating a life raft which permits automatic venting of the raft inflation chambers when the raft is in a noninflated state and includes a failsafe actuator arrangement for preventing inadvertent actuation of the mechanism. Automatic venting is provided through means of a tilt-type poppet valve, and failsafe actuation is provided through a cam controlled valve arrangement wherein the cam has an initial nonactuating range of rotation and a subsequent actuating range of rotation.

3,559,690
DIVERTER VALVE
Patsy B. Palmer, Granada Hills, Calif., assignor to Price-Pfister Brass Mfg. Co., Pacoima, Calif., a corporation of California
Filed May 8, 1969, Ser. No. 822,884
Int. Cl. F16k *15/8*
U.S. Cl. 137—801 9 Claims



The new diverter valve utilizes a loose fitting O-ring surrounding a cylinder fitted into the mouth of a spout. A flange on the cylinder expands the O-ring to provide a seal when the cylinder is in its lower position. When the cylinder is raised, a caged lid closes the cylinder. A skirt formed on the lid moves downwardly and acts as a packing gland to constrict the O-ring thus to perfect a seal. When hydraulic pressure is reduced, the pressure on the O-ring is relieved whereby the cylinder is free to fall away under the influence of gravity.

3,559,691
CASING FOR THE RECEPTION OF AIR FILTERS
Gerhard Max Neumann, Berlin-Dahlem, Germany, assignor to Delbag Luftfilter G.m.b.H., Berlin-Halensee, Germany
Filed Dec. 11, 1967, Ser. No. 689,545
Claims priority, application Germany, July 21, 1967, D 53,659
Int. Cl. F16s *45/00*
U.S. Cl. 138—92 9 Claims

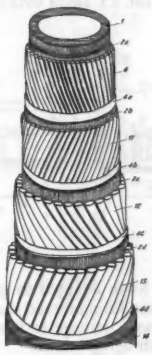


Casings for air filters for use in nuclear plant should have the minimum of weld joints to ensure gas-tightness. The invention provides a form of construction requiring only about a quarter of the welding normally required, and furthermore allows lighter gauge metal to be used, by forming three sides of the open ended casing from a single sheet of metal, which is bent and flanged to the required shape, the remaining flanges being welded onto the bent integral part.

3,559,692
FLEXIBLE TUBES
Jean Mantelet, Paris, France, assignor to Moulinex S. A., Bagnolet, France
Filed Apr. 11, 1968, Ser. No. 720,680
Claims priority, application France, Apr. 20, 1967, 103,453
Int. Cl. F16l *11/06*
U.S. Cl. 138—121 5 Claims

A flexible tube having a wall of wavy section each wave having successive folds opening inwardly and outwardly, the crest of at least one of the folds of each wave having a narrowly concave outline.

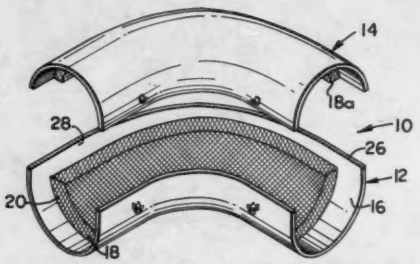
3,559,693
WINDABLE FLEXIBLE SHAFT CAPABLE OF WITHSTANDING HIGH TRACTIVE FORCES AND TORSIONAL STRESSES
Remi Reynard, Montesson, France, assignor to Institut Francais Du Petrole Des Carburants Et Lubrifiants, Malmison, France
Filed Apr. 30, 1968, Ser. No. 725,426
Claims priority, application France, May 5, 1967, 105,469
Int. Cl. F16l *11/08, 11/14, 11/08, 11/14*
U.S. Cl. 138—133 12 Claims



This flexible shaft includes a flexible core surrounded with at least one armoring constituted of at least two layers of helically wound metallic wires or cables. This shaft is characterized in that each armoring layer is provided with an anchoring layer wherein it is embedded, this anchoring layer being constituted of an elastomeric or thermoplastic material which has been subjected to a thermal treatment, in combination with a thin hooping and separating layer which

covers the armoring layer and is constituted of a material which can withstand the thermal treatment without flowing, this material preferably retracting under the conditions of this thermal treatment.

3,559,694
REMOVABLE INSULATED FITTING FOR PIPE JOINTS
Fred J. Volberg, Lafayette, Calif., assignor to Associated Insulation of California, Richmond, Va., a corporation of California
Filed Apr. 14, 1969, Ser. No. 815,877
Int. Cl. F16l *59/16*
U.S. Cl. 138—147 **8 Claims**

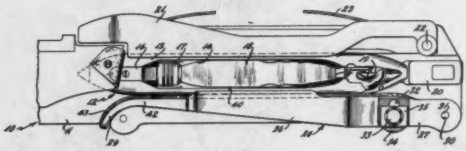


A removable insulation unit for surrounding pipe joints, particularly at fittings such as elbows, T's and the like comprises a pair of relatively thin outer shells which are connectable by fastener means to form a cylindrical cover. An insulation liner surrounded by a perforated member is secured within each shell member by hook members that extend inwardly from its inner wall.

ERRATUM

For Class 138—149 see:
Patent No. 3,559,660

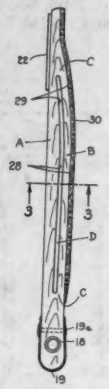
3,559,695
LOOM RIGHT-HAND BOX FRONT
William J. Kelly, Rte. 3, Box 468, Rockingham, N.C. 28379
Filed Jan. 21, 1969, Ser. No. 792,558
Int. Cl. D03d *49/52*
U.S. Cl. 139—183 **2 Claims**



A box front for a loom adapted to guide and position or box a shuttle so that the filling thread may be severed and the bobbin removed without damage to the shuttle or impairing the quality of the cloth being woven.

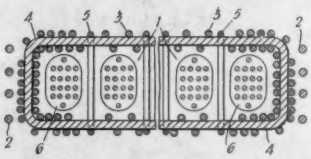
3,559,696
SHUTTLE CHECKING DEVICE
Coy L. Huffman, Jr., 107 Brookside Way, Greenville, S.C., and James Earl Huffman, 10 Broadmoore Drive, Greenville, S.C.
Filed Oct. 20, 1969, Ser. No. 867,658
Int. Cl. D03d *49/54*
U.S. Cl. 139—185 **2 Claims**

A shuttle binder has a thin flat member and an elongated element constructed from a single unitary wooden blank, said blank having been compressed and densified by the application of heat and pressure along opposite sides thereof across



said flat member so that said flat member is capable of dissipating heat and withstanding flexing and impact from the shuttle during weaving.

3,559,697
EDGE STRUCTURE FOR AIRCRAFT ARRESTING TAPES
Denis Whalen, Cleckheaton, England, assignor to BBA Group Limited, Cleckheaton, Yorkshire, England
Filed Mar. 3, 1969, Ser. No. 803,823
Claims priority, application Great Britain, Mar. 5, 1968, 10,575/68
Int. Cl. D03d *5/00*
U.S. Cl. 139—408 **3 Claims**

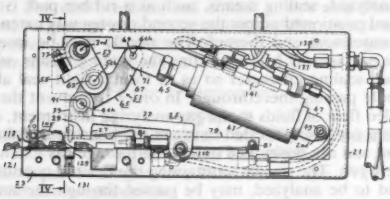


An arrestor tape for use in aircraft arresting means comprising a woven body portion having secured thereto, along the edge portions thereof, abrasion resistant longitudinally extending threads.

3,559,698
CABLE SPLICER TOOL
Van Z. Smith, Mineral Wells, Tex., assignor to All Products Company, Mineral Wells, Tex.
Filed July 22, 1968, Ser. No. 746,510
Int. Cl. B21f *15/00*
U.S. Cl. 140—105 **7 Claims**

A cable splicer tool particularly adapted for splicing the conductor pairs of telephone trunk cables. A fluid operated power cylinder and piston rod work a toggle linkage mechanism to actuate a pivoted hammer which coacts with a feed table on which connectors to be crimped are moved. The feed table includes an anvil portion, with the anvil mounted for limited resilient movement. A cutter blade is mounted on the hammer to cooperate with the anvil portion

to sever taped connectors on the hammer crimping stroke. A fluid operated feed cylinder and piston rod reciprocate a connector feed pawl, with the feed cylinder and above-mentioned power cylinder connected to a common fluid supply source such that the feed pawl moves in its return stroke



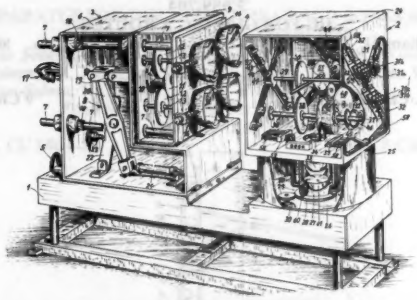
direction when the power piston rod is extended on its crimping stroke. Damping means are provided to slow down the movement of the feed pawl during the feed stroke of the feed cylinder piston rod. A feed retainer pawl holds the connector next to be crimped against rearward movement as the feed pawl moves on its return stroke.

3,559,699

METHOD AND APPARATUS FOR WINDING OF STATOR FOR ELECTRIC MACHINES

Hans Droell, Bergen-Enkheim, Germany, assignor to Balzer & Droll KG, Rosenhelle, Germany

Filed Aug. 7, 1968, Ser. No. 750,930
Claims priority, application Germany, Aug. 9, 1967, 1,613,021
Int. Cl. B21f *3/00*
U.S. Cl. 140—92.1 **19 Claims**



An arrangement for winding coils for stators including a winding drum driving mechanism and a template carrier mechanism, the latter including a multisided rotatable housing having a set of templates on each lateral surface. The templates of each set are movable radially outwardly for alignment with corresponding winding funnels and radially inwardly for simultaneous removal of all coils; and the housing is rotatable to position successive sets of templates for receiving coils while already wound coils are being removed.

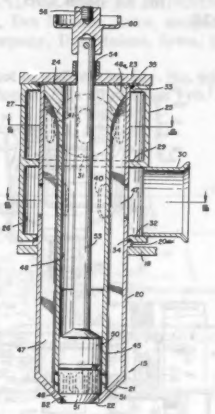
3,559,700

METHOD AND APPARATUS FOR FILLING CONTAINERS WITH MULTIPLE SEPARATE STREAMS OF VISCOUS MATERIAL

Leonard A. Erickson, Columbus, Ohio, assignor to Big Drum, Inc., Columbus, Ohio, a corporation of Ohio

Filed Jan. 21, 1969, Ser. No. 792,659
Int. Cl. B65b *1/06*
U.S. Cl. 141—9 **9 Claims**

Process and apparatus for filling a transparent container with multiple viscous materials, such as edible substances, supplied as separate independent streams and kept independently and completely separate from each other until they enter the container and in which the materials will assume a predetermined pattern. The apparatus includes a nozzle which can be moved vertically or axially relative to the container and an associated valve which can quickly start and cut off the flow of all the separate streams simultaneously.

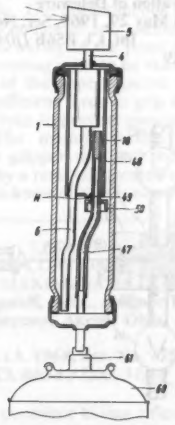


3,559,701

AEROSOL STORAGE CONTAINER AND REFILLABLE DOSING SPRAYER

Adam Wittersheim, Nieder-Ramstadt, and Albert Kolb, Darmstadt-Eberstadt, Germany, assignors to Goldwell GmbH, Darmstadt-Eberstadt, Germany, a corporation of Germany

Filed Apr. 18, 1969, Ser. No. 817,446
Claims priority, application Germany, Apr. 27, 1968, P1,750,400
Int. Cl. B65b *31/00*
U.S. Cl. 141—20 **3 Claims**

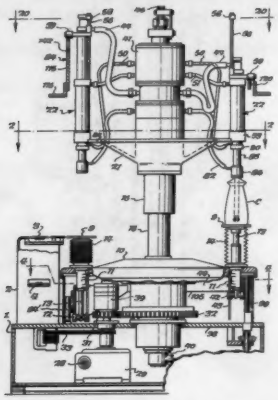


Refillable sprayer apparatus employs a filling valve and an air-release valve which are directly or indirectly mechanically linked to provide sufficient filling of the sprayer while at the same time preventing overfilling and a resulting loss of excess liquid.

3,559,702
CONTAINER FILLING MACHINE

James H. Riesenberg, Amherst, N.Y., assignor to Consolidated Packaging Machinery Corporation, Buffalo, N.Y.

Filed Jan. 24, 1968, Ser. No. 700,129
Int. Cl. B65b 3/36
U.S. Cl. 141—128 10 Claims

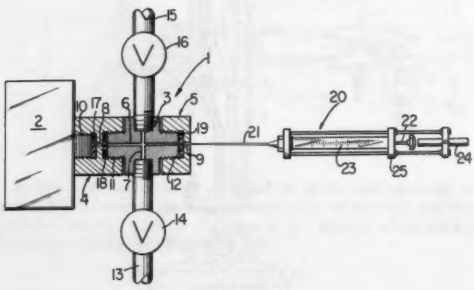


A filling head having a stem movable into and out of a submerged filling position relative to a container supporting tray is mounted for movement with the tray through a path and the stem is moved into and out of filling position as the tray and head are moved through the path. The filling position of the stem is controlled by a cam having relatively movable sections one of which determines the spacing between the tray and the stem when the latter is in its fully submerged filling position. The cam also includes relatively movable sections for selectively varying the point along the path at which filling through the stem is cut off.

3,559,703
FLUID SAMPLE INJECTOR FOR GAS CHROMATOGRAPH

Robert V. Maul, Tulsa, and Everett L. Swalley, Barsdall, Okla., assignors to Cities Service Oil Company, Tulsa, Okla., a corporation of Delaware

Filed May 29, 1969, Ser. No. 828,864
Int. Cl. B56b 1/04
U.S. Cl. 141—329 10 Claims



A fluid sample to be analyzed is delivered to a fluid analyzing instrument, e.g. a gas chromatography column, by delivery through conduit means to a passageway inside a housing removably secured to the fluid analyzing instrument. Interconnecting with this passageway is a second passageway extending from the outer end of the housing to the end thereof secured to the instrument. This second passageway is aligned with the point at which the fluid may be injected into the fluid analyzing instrument. A syringe-type device having a needle adapted to fit in this second passageway and having a sufficient length to extend therethrough into the fluid analyzing instrument is provided. In order to prevent the venting of the fluids delivered to the interconnecting passageways, thereby affecting the composition of the fluid to be analyzed, sealing means, such as a rubber pad, is provided and positioned across the second passageway extending to the outermost end thereof. The needle may be inserted into the passageway by penetrating the sealing means, which has a self-sealing character so as to form a tight seal about the needle passing therethrough. In order to prevent the uncontrolled flow of fluids to the gas analyzing instrument, sealing means are also provided between the housing and the instrument and are positioned across the passageway extending therebetween. The needle, containing the desired quantity of the fluid to be analyzed, may be passed through the sealing means into the gas injection point of the instrument. The housing is conveniently formed in three parts, an intermediate cell having the interconnecting passageways extending therethrough, an inner end cap removably secured to this cell and the instrument and having a passageway extending therethrough in alignment with the end to end passageway in the cell, and an outer end cap removably secured to said cell and also having a passageway extending therethrough in alignment with the end-to-end passageway extending through the cell. The sealing means across the passageway extending from end to end of this three-part housing are positioned between the outer end cap and the cell, between the cell and the inner end cap, and between the inner end cap and the fluid analyzing instrument. Thus, a fluid sample delivered to the passageways in this fluid injector device may be passed therefrom into the analyzing instrument by means of the needle portion of the syringe-type device without any change in composition, so that the results of the fluid analyzing operation will accurately reflect the composition of the gas being analyzed.

3,559,704
JIG FOR GUIDING A ROUTER

William H. Thompson, 4149 Eliot St., Denver, Colo. 80211

Filed May 1, 1969, Ser. No. 820,939
Int. Cl. B27f 5/12
U.S. Cl. 144—144.5 9 Claims

The jig is attached to a door jamb by pins mounted on longitudinal adjustable end brackets which are adjustable inwardly on the underside of and into an aperture in a plate which is engaged by the base of the router. The end brackets are also provided with spacers which extend to the surface of the door jamb. The side of the plate aperture is closed by a side plate which also extends to the door jamb. A corner guide having a notch, which fits against a corner of the end bracket, together with the inner ends of the end brackets, guides the router in forming a shallow groove for a strike plate, after a well for the catch box has been formed by the

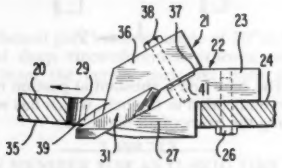
router, adjusted to cut to a greater depth. A removable template having an aperature for guiding the router in cutting the well rests against the inwardly extending ends of the end brackets and the corner guides, and is provided with a strip which engages the underside of the main plate. A pair of abutments, adjustable on the underside of the main plate, determine the spacing of the jig from the side of the door jamb. The end brackets and corner guides may also be adjusted to guide the router in cutting a different size or shape of groove, while an alternative template is used in guiding the router to cut a different size of well.

3,559,705

CHIPPER KNIFE AND KNIFE MOUNTING FOR DRUM TYPE WOOD CHIPPER

Frank Louis Salzmann, Jr., 1713 Lomb Ave. W., P.O. Box 3885, Birmingham, Ala.

Filed Sept. 11, 1968, Ser. No. 758,972
Int. Cl. B27l *11/02*; **B27g** *13/04*
U.S. Cl. 144—162 **5 Claims**



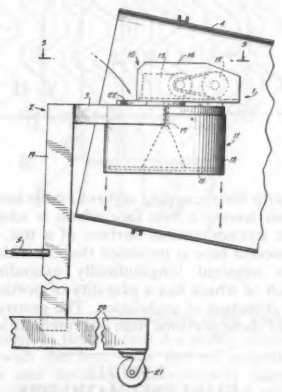
A simplified and secure mounting for a reversible symmetrical knife for a drum type wood chipper. The knife produces a controlled size chip as required by the paper industry.

3,559,706

APPARATUS FOR DISUNITING MEAT AND BONES AND CARRIAGE SUPPORT THEREFOR

Lucas Jones Conrad and Cyrus Alfred Alldred, Jr., Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Co., Winston-Salem, N.C., a corporation of New Jersey

Filed Sept. 13, 1968, Ser. No. 759,709
Int. Cl. B02b *7/04*; **A01f** *31/00*
U.S. Cl. 146—76 **8 Claims**



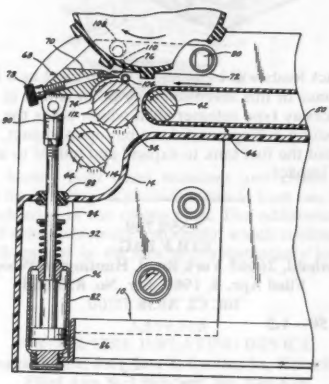
A food processing apparatus for disuniting soft edible material from harder inedible portions in appropriate foodstuffs comprising a horizontal rotating disc with a ribbed surface which cooperates with a series of tines arranged in radially extending curves above the surface in a pinwheel formation to disunite the component food parts which are introduced from above. The disc drive means is supported above the disuniting section and the entire apparatus is cantilevered on a support carriage permitting ready accessibility, adjustment and dismantling of the various members for operating and cleaning.

3,559,707

METHOD AND MEANS FOR SKINNING MEAT

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa, a corporation of Iowa

Continuation-in-part of application Ser. No. 616,692, Feb. 16, 1967, now abandoned. This application Feb. 20, 1968, Ser. No. 706,941
Int. Cl. A22c *17/12*
U.S. Cl. 146—130 **5 Claims**



A meat skinning machine of the type having a skin gripping roll and a concave shoe cooperating with a skinning blade and the gripping roll to pull the skin through the machine and part the skin from a piece of meat. A stripper roll is mounted adjacent the gripper roll to strip the skin from the gripper roll after the skin has been removed from the meat. The shoe and skinning blade are held concentrically with the gripping roll by air piston means. The air piston means are controlled by a photoelectric cell means which functions to instantaneously move the shoe and blade to the skinning position as soon as the meat approaches the close proximity of the blade. The instantaneous initial bite of the blade into the meat is enhanced and accelerated by pivoting the shoe above and forwardly of the point of engagement of the blade with the oncoming meat to be skinned. The method involves the holding of the shoe adjacent the gripping roll concentrically with sufficient force to grip the removed skin but with insufficient force to prevent puncture of the skin by the gripping roll. The method further holds the skin uniformly against the gripper roll, and then strips the skin from the gripper roll by a remotely located stripper roll to insure that a uniform thickness of skin is removed.

3,559,708

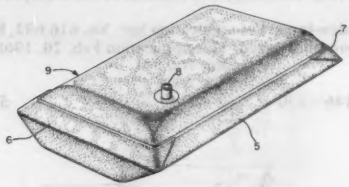
IMPACT-RESISTANT CONTAINER AND METHOD OF MAKING SAME

Richard L. Cook, Flagstaff, Ariz., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio, a corporation of Ohio

Filed Nov. 13, 1968, Ser. No. 775,365
Int. Cl. B65d *37/00*, *31/10*
U.S. Cl. 150—1 **9 Claims**

An impact-resistant container having a flexible walled, rupture resistant, fluid impervious body portion in which one or more pleats are formed. The pleats are secured in a folded position by use of an adhesive or by sewing or interweaving the pleated portion with threads or fibers of sufficient strength to hold the pleats in a folded position during normal use of the container as a vehicle fuel tank or for carrying other liquid substances. Upon being subjected to high impact loads, the folded pleats unfold to increase the volume of the

container and while unfolding, absorb the energy of impact upon the container to prevent its bursting. This invention is particularly useful in preventing rupture of fuel tanks in airplane or automotive vehicles and greatly reduces the likelihood of fires which result from such ruptured fuel tanks, air droppable containers and any tank or container where



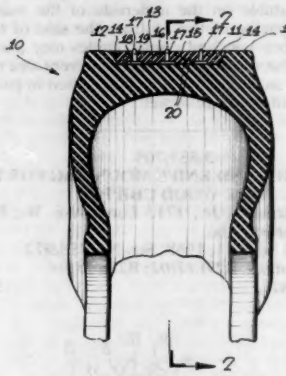
high impact loads will be applied. When used as a fuel tank, the container of this invention may be mounted in a vehicle in a breakaway type retainer shell which holds the tank in a folded position during normal use but upon impact, will open up to permit the fuel tank to expand and unfold to absorb the energy of impact.

3,559,709
GOLF BAG
Paul F. Seibold, 26665 York Road, Huntington Woods, Mich.
Filed Apr. 4, 1969, Ser. No. 813,568
Int. Cl. A63b *55/00*
U.S. Cl. 150—1.5 **7 Claims**

The golf bag for a plurality of clubs is of elongated rectangular form having a closed bottom and an open top which is reinforced to provide added strength thereat. A keyhole slot is provided in one side of the bag spaced a short distance from the top open end and a keyhold slot is provided in the opposite side of the bag spaced from the lower closed end thereof. With this arrangement the bag can be supported from either side of a cart to avoid having right and left-hand bags when two bags are carried.

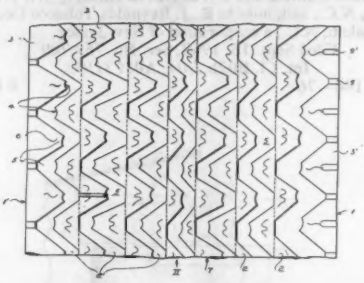
3,559,710
TIRE OF SEPARABLE TREAD RING TYPE
Josephat R. Deslauriers, Renfrew, Ontario, Canada, assignor to William Joseph Larocque, Field, Ontario, Canada, a part interest
Filed July 26, 1968, Ser. No. 747,905
Int. Cl. B60c *11/02, 11/16*
U.S. Cl. 152—176 **5 Claims**

A pneumatic tire of the separable tread ring type has a groove in its tread portion with an endless rubber belt removably seated in the groove. A plurality of metal studs are embedded in the belt, each stud being of one-piece form and having a flat base and a calk projecting from the surface



of the belt. The base and a substantial portion of the calk of each stud are embedded in the belt, which has reinforcement cords overlying the bases of all the studs.

3,559,711
TREAD STRIP
Wilhelm Schelkmann, Witten(Ruhr), Germany, assignor to Vakuum Vulk Holdings Ltd, Nassau, Bahamas, a corporation of Bahama by mesne assignment to
Filed Aug. 22, 1968, Ser. No. 754,565
Claims priority, application Germany, Sept. 5, 1967, Sch 43313
Int. Cl. B60c *11/12*
U.S. Cl. 152—209 **7 Claims**

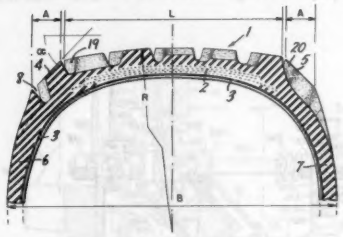


A tread strip for recapping of tires comprises an elongated strip member having a first face which is adapted to be affixed to the circumferential surface of a tire, and a second face. The second face is provided therein with a plurality of transversely adjacent longitudinally extending undulating grooves each of which has a plurality of portions at which it changes its direction of undulation. The grooves are wider in the region of these portions than intermediate such portions.

3,559,712
GIANT PNEUMATIC TIRE
Henri Verdier, Beauregard-L'Eveque, France, assignor to Compagnie Generale Des Etabissements Michelin raison sociale Michelin & Cie, Clermont-Ferran (Puy-de-Dome), France
Filed Mar. 26, 1969, Ser. No. 810,676
Claims priority, application France, Mar. 28, 1968, 146,050
Int. Cl. B60c *11/08, 13/00, 9/22*
U.S. Cl. 152—209 **8 Claims**

A pneumatic tire is adapted for public works machines by dividing the tread into a center part and two lateral parts.

The width of the center part is 50 percent to 80 percent of the width of the tire, and the width of each lateral part is 5 percent to 20 percent of the width of the tire. The outer surface of each lateral part forms an angle of 30° to 50° with the tire axis, and deep circumferential grooves separate each lateral part from the center part and from the adjacent sidewall.

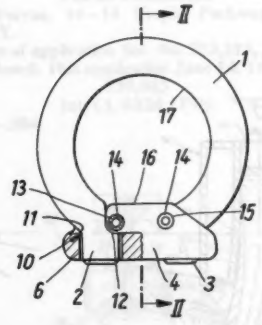


3,559,713

CLOSURE MEMBER FOR ANTI-SKID TIRE CHAINS

Anton Mueller, Unterkochen, and Guenter Witzel, Aalen, Wurttemberg, Germany, assignors to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Wurttemberg, Germany

Filed July 8, 1968, Ser. No. 743,083
Claims priority, application Germany, July 8, 1967, P1605672
Int. Cl. B60c *27/00*
U.S. Cl. 152—243 **13 Claims**



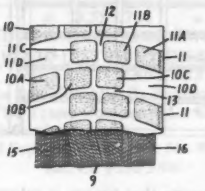
A link with two sections releaseable from each other for antiskid tire chains. A first section is a nearly annular portion open radially with the free ends thereof extending in the same direction and forming approximately parallel stable cross section legs offset to extend toward each other at radially outer locations defining therebetween a passage for introducing link members into and withdrawing link members from the annular portion. A second section forms a closing member and has two receiving openings respectively detachably receiving the legs for closing and opening the passage. The legs are provided with shoulder means at radially inner location. The pin means releaseably extend transversely through the closing member at protected inner location and engage at least one of the shoulder means for detachably securing the closing member to the first section.

3,559,714

TIRE COVERS

Henri Verdier, Puy-de-Dome, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, Puy-de-Dome, France

Filed July 29, 1968, Ser. No. 748,472
Claims priority, application France, July 27, 1967, May 16, 1968, 116,031; 152,128
Int. Cl. B60c *9/10*
U.S. Cl. 152—361 **4 Claims**



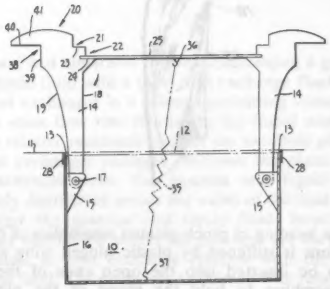
A tire having bold tread moldings and crown plies underneath the moldings is provided with at least one additional ply at each edge of the crown plies. The additional plies are formed of cords which are extensible, which contract in heat, and which extend in the tire in a substantially longitudinal direction.

3,559,715

TRUCK TIRE INFLATING DEVICE

Alfred Beattie Leslie, P.O. Box 8, Lowbanks, Ontario, Canada

Filed Aug. 1, 1969, Ser. No. 846,676
Claims priority, application Canada, May 15, 1969, 51,637
Int. Cl. B60c *25/00*
U.S. Cl. 157—1 **7 Claims**



A safety device for preventing lockring escapement during tire inflation comprising two or more elongated jaw members which are pivotally secured in a housing mounted in a rim supporting surface such as a concrete floor. The jaw members hinge out of the housing and are held in engagement against a wheel rim, positioned over the housing, by a spreader bar which is held between its ends against the jaw members. The jaws are adapted to overlap the lockring to prevent escapement thereof and further hold the rim rigidly on the supporting surface.

3,559,716

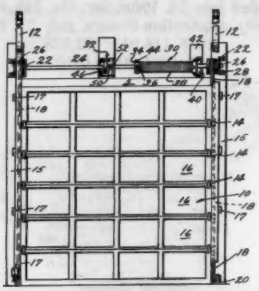
TEMPERATURE-ACTUATED OVERHEAD DOOR

Arthur F. Loucks, R.D. No. 2, Mount Pleasant, Pa. 15666

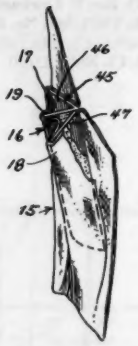
Filed Aug. 15, 1969, Ser. No. 850,443
Int. Cl. E05f *15/20*
U.S. Cl. 160—9 **5 Claims**

A sliding overhead door is normally maintained in its up position by means of at least two helical torsion springs ar-

ranged to apply torque to a rotatable shaft which in turn applies a lifting force to cables secured to the door. One of the torsion springs applies torque to the shaft through a heat-fusible connection whereby that torque is released upon fusion of the connection as the result of fire, to allow the door to close against the action of the remaining spring.



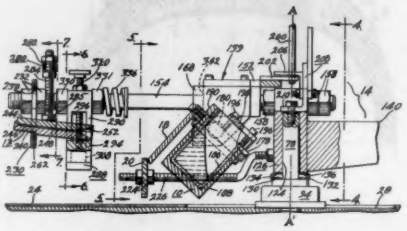
3,559,717
PINCH PLEATED CURTAIN HEADING STIFFENERS
Milton Kalder, 1065 Lorraine Drive, Franklin Square, N.Y.
Filed Apr. 21, 1969, Ser. No. 817,898
Int. Cl. A47h *13/14*
U.S. Cl. 160—348 **2 Claims**



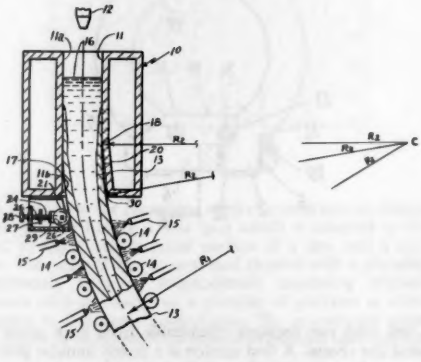
A curtain heading of pinch-pleated assemblies of butterfly configurations is stiffened by plastic hinged wing stiffeners adapted to be inserted into the open ends of the pinch-pleated assemblies to hold the shape of the pleats and removable therefrom when the curtain is to be washed or dry cleaned. These stiffeners being made of two wings to accommodate the two outside pleats or with a central wing to accommodate the partial inner pleat of the assembly. These same stiffeners when provided with adhesive can be used as a backing on which to form the pleats and heat pressed to adhere the curtain material to the stiffeners so that the stiffeners become a permanent part of the curtain.

3,559,718
METHOD AND APPARATUS FOR CENTRIFUGAL CASTING OF MOLTEN METAL
Jay R. Hitchings, Downingtown, Pa., assignor to Foote Mineral Company, Exton, Pa., a corporation of Pennsylvania
Filed Sept. 6, 1968, Ser. No. 758,018
Int. Cl. B22d *13/06, 13/10*
U.S. Cl. 164—144 **7 Claims**

Apparatus and method especially suitable for casting low-density, high-surface tension, molten materials of high chemical activity into thin sheets. A crucible containing the molten material and having a top opening is mounted on a carriage which is in turn slidably mounted on one arm of a centrifuge. A mold for receiving the molten material is also mounted on the centrifuge arm, radially-outward of the crucible. The carriage is initially held at a radially inward position as the centrifuge is started up, and then released to slide rapidly outward against a stop arrangement which arrests its outward motion abruptly. During its radially-outward motion the crucible is tilted outwardly to a substantially horizontal position so that, when its outward motion is abruptly arrested, the crucible opening confronts the fill opening in the mold. The molten metal is thereby thrown out of the crucible through the top opening thereof into the mold-fill opening with a high velocity sufficient to cause injection of the molten material into the mold despite small lateral dimensions of the mold cavity. The mold may be of metal and operated relatively cool.



3,559,719
CONTINUOUS CASTING MOLD
Irving Rossi, Morristown, N.J., assignor to Concast Incorporated, New York, N.Y.
Filed Jan. 25, 1968, Ser. No. 700,509
Int. Cl. B22d *11/12*
U.S. Cl. 164—273 **6 Claims**

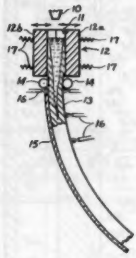


An open ended continuous-casting mold, from which the strand cast therein is conducted away from it along a curved path, has a generally straight mold cavity. The lower portion of the side of the cavity toward the center of curvature of the path is slanted outward, the upper and lower ends of the slanted portion being on a curve having approximately the same degree of curvature as the path, and a spring-loaded roll at the exit end of the mold is adapted to press the strand laterally toward the slanted portion.

3,559,720
CONTINUOUS CASTING APPARATUS HAVING A TWO PART SEPARABLE MOLD

Eric T. Vogel, Elmhurst, N.Y., and Herbert Fastert, Wyckoff, N.J., assignors to Concast Incorporated

Filed May 10, 1968, Ser. No. 728,217
Int. Cl. B22d *11/00*
U.S. Cl. 164—273 9 Claims

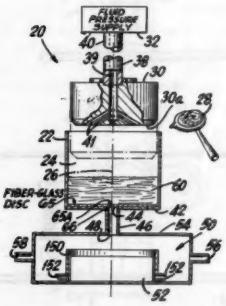


A mold assembly for a continuous casting mold, which has an open ended mold cavity therethrough, is in two parts that are separable at a plane extending axially through the cavity. The parts are held together, under pressure, by springs, or hydraulic or pneumatic means, and they are separated by toggle levers, which are operable to overcome the pressure normally holding the parts together. Guide rolls adjacent the exit end of the mold cavity, for guiding a strand out of the mold, hold the emerging strand in fixed axial relation to the center line of the mold cavity. The mold assembly is constructed and arranged for both parts of the mold to move back from opposite sides of a strand in the mold, when the mold parts are separated at the end of a casting run, and thereby assure complete release of the strand from the mold.

3,559,721
APPARATUS FOR PRESSURE CASTING BY DIRECT FLUID PRESSURE

Vincent J. Forras, 14—14 Utopia Parkway, Beechhurst, Queens, N.Y.

Continuation of application Ser. No. 373,213, June 8, 1964, now abandoned. This application June 14, 1968, Ser. No. 739,903
Int. Cl. B22d *17/06*
U.S. Cl. 164—304 1 Claim

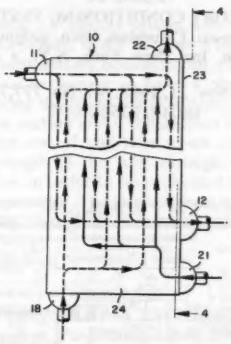


For casting a linear strip fill in a longitudinal slot, such as in a stack of aligned peripherally slotted laminations, to form cast metal bars, the stack is disposed in a chamber space of a close fitting main enclosure whose confining wall inner surface is congruent with the virtual desired external contour of the bars to be cast in the slot, so no further shaping or machining of the bar is necessary. The main enclosure is open at its front end as a vent to establish a high pressure gradient for the molten metal set into the other end at high pressure. The molten metal is held in an auxiliary chamber by a frangible disc and high pressure on the molten metal fractures the disc and forces the molten metal into the main chamber at high pressure that makes the location of the vent important in this case, and useful in aiding the movement of the molten metal into the slots to be filled. One guide in front of the body to be filled helps to guide the high-pressure metal. A second guide behind the body directs excess metal away from the body in individual pin type bars for subsequent easy removal.

3,559,722
METHOD AND APPARATUS FOR TWO-PHASE HEAT EXCHANGE FLUID DISTRIBUTION IN PLATE-TYPE HEAT EXCHANGERS

James J. Schauls and Franklin D. Duncan, La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis., a corporation of Wisconsin.

Filed Sept. 16, 1969, Ser. No. 858,373
Int. Cl. F28f *3/00*
U.S. Cl. 165—1 32 Claims



Method and apparatus for heat exchanging a gaseous fluid and a liquid fluid with a third heat exchange fluid by a plate-type heat exchanger in a manner permitting variations of the gaseous mass flow rate relative to the liquid mass flow rate without relative maldistribution of the two fluid phases within the heat exchanger passages. Between the plates within the heat exchanger core, the gaseous and liquid fluids are separately distributed across the width of the heat exchanger. Only after the gaseous and liquid fluids have been thus uniformly distributed within the passages are they combined and passed in heat exchange relation with the third heat exchange fluid. The problems associated with relative maldistribution of the two fluid phases which normally accompany conventional arrangements for distributing a two-phase fluid across the width of a plate-type heat exchanger are thus avoided. Four embodiments of the invention are described and shown.

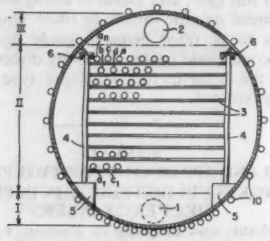
3,559,723
SEPARATING SUBLIMATION PRODUCTS FROM GASES

Walter Mann, Lampertheim, Joachim Wagner, Ludwigshafen, and Werner Jaeger, Mannheim, Germany, assignors to Badische Anilin- and Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine) Rhineland-Pfalz, Germany

Filed Oct. 31, 1968, Ser. No. 772,212
Claims priority, application Germany, Nov. 3, 1967, P1,619,841
Int. Cl. F25b *13/00*
U.S. Cl. 165—2 2 Claims

Separating sublimation products from gases in nested tube separators having heat exchange in the interior of the separator as well as from the outer wall, the outer wall being kept,

during the sublimation and melting out of the sublimation product, substantially constantly at a temperature which is somewhat above the melting point of the sublimation



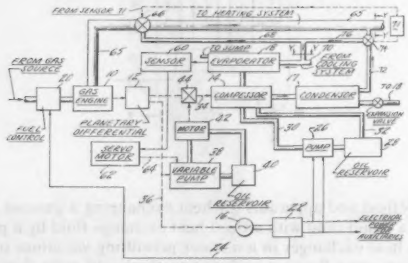
product; in the corresponding apparatus, the heat exchange system for the interior and that for the exterior of the separator are separate from each other.

3,559,724

COMFORT CONDITIONING SYSTEM

William H. Wilkinson, Columbus, Ohio, assignor to American Gas Association, Inc., New York, N.Y., a corporation of New York

Filed Nov. 21, 1968, Ser. No. 777,731
Int. Cl. F25b *13/00*
U.S. Cl. 165—2 **24 Claims**



The heating and cooling of building structures is accomplished by driving an air conditioning system compressor with an internal combustion engine. In the heating mode, engine waste heat and condenser rejected thermal energy are used to supply heat to the structure and the total thermal energy rejected by the condenser is increased by feedback of energy from the condenser to the evaporator to create an artificial cooling load. Heating is, accordingly, accomplished without reversal of the refrigerant system. In addition, the present invention is self-sustaining as long as fuel is supplied to the engine by virtue of inclusion of a generator which is driven by the engine; means for adjusting the engine shaft power split between the generator and compressor in response to evaporator conditions being included.

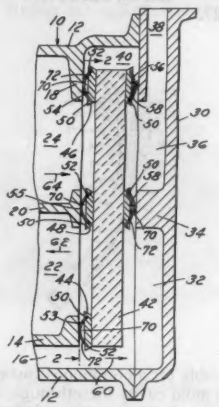
3,559,725

FOIL SEAL FOR ROTATING HEAT EXCHANGERS OF GAS TURBINE ENGINES

Carlo A. Fucinari, Dearborn Heights; Michael A. Pulick, Livonia, Mich.; John J. Trudeau, Avon, N.C., and James K. Vallance, Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

Filed Oct. 10, 1969, Ser. No. 865,330
Int. Cl. F28d *19/04*
U.S. Cl. 165—7 **7 Claims**

A flexible metal foil has its longitudinal edges inserted into slots cut into a shoe rubbing on a rotating regenerator core. The intermediate portion of the foil bows outwardly away from the shoe and bears against the engine housing. Gas pressure is admitted to the space between the foil and the



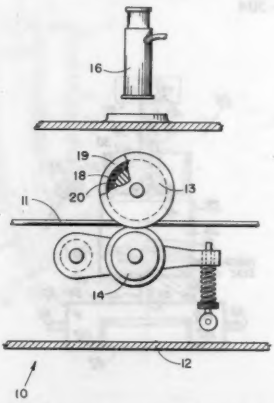
shoe to maintain the foil in contact with the housing and the walls of the slots. The seal readily absorbs thermally induced dimensional changes between the core, shoe, foil and housing.

3,559,726

TEMPERATURE MONITOR

George N. Menasoff, Hastings-On-Hudson, N.Y., assignor to Anaconda Wire and Cable Company, a corporation of Delaware

Filed July 24, 1968, Ser. No. 747,250
Int. Cl. F28f *13/00*
U.S. Cl. 165—11 **7 Claims**



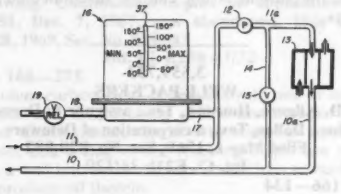
The temperature of an advancing wire that, because of its low emissivity, could not be measured accurately by a radiation pyrometer is measured indirectly by sensing the radiation from a high emissivity sheave which is heated by the wire conductively.

3,559,727

ACCUMULATOR-RESERVOIR IN A COOLING SYSTEM

David T. Hill and Pritam S. Bathla, Dayton, Ohio, assignors to United Aircraft Products, Inc., Dayton, Ohio, a corporation of Ohio

Filed Dec. 20, 1968, Ser. No. 785,587
Int. Cl. F25b 45/00
U.S. Cl. 165—11 9 Claims



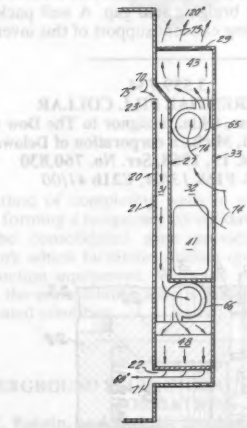
An accumulator-reservoir device, used in a system circulating a liquid coolant, in which a biased pressure applying member moves to reflect changing temperature induced density of the coolant. A window and an appropriately placed temperature scale traversed by the pressure applying member provide means for visually indicating the amount of expansion volume actually in use and for simultaneously comparing such amount with an amount proper for the existing ambient temperature.

3,559,728

ELECTRONIC EQUIPMENT RACK TEMPERATURE CONTROL

Roger T. Lyman, Princeton, and William G. Stewart, Pennington, N.J., assignors to Kooltronic Fan Company, Princeton, N.J., a company of New Jersey

Filed Nov. 29, 1968, Ser. No. 779,886
Int. Cl. F24h 9/04
U.S. Cl. 165—55 11 Claims



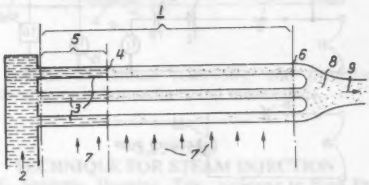
A self-contained cooling or heat exchange unit whose depth is quite small to permit external mounting of the unit to the wall of an enclosure for cabinets and the like as a door for the enclosure or as a separator positioned within a narrow clearance between cabinets.

3,559,729

THERMODYNAMIC CIRCULATORY SYSTEM APPARATUS

Reinhart Radebold, Berlin, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Nov. 27, 1968, Ser. No. 779,587
Claims priority, application Germany, Nov. 27, 1967, 1,601,002.9
Int. Cl. F28d 15/00; H02b 45/00
U.S. Cl. 165—107 6 Claims



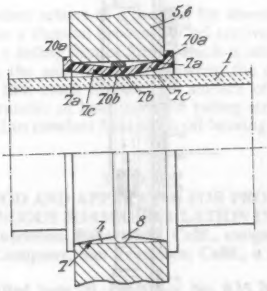
Thermodynamic circulatory system with a heat exchanger of high heat flux density which receives a liquid metal stream and delivers a substantially homogeneous, two-phase metallic stream. The heat exchanger includes a plurality of parallel tubes for receiving the liquid metal stream; each tube having a constant cross section and a constriction located at a point beyond the inlet end of said tube which corresponds to no less than the length of the tube through which the liquid stream must flow in order to be preheated to at least its initial boiling temperature. The liquid stream is converted into a low vapor quality, two-phase stream as it passes through such constriction.

3,559,730

TUBULAR HEAT EXCHANGER

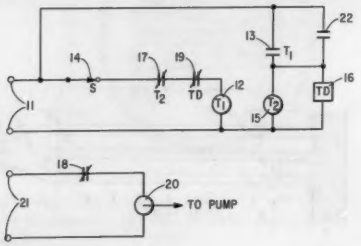
Rene Pierre Denjean, Pavillon-sous-Bois, France, assignor to Societe Tunzini Ameliorair, Paris, France

Filed Mar. 6, 1969, Ser. No. 804,753
Claims priority, application France, Mar. 8, 1968, 143,111
Int. Cl. F28b 9/04
U.S. Cl. 165—178 10 Claims



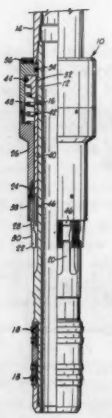
A tubular heat exchanger includes a plurality of heat exchange tubes mounted between two tube support plates having apertures to accommodate the ends of these tubes. A sealing sleeve is interposed between the end of each tube and the associated aperture, this sealing sleeve having at least one and preferably two external sealing zones adapted to seal against the edges of the aperture and at least one external sealing zone adapted to seal against the tube.

3,559,731
PUMP-OFF CONTROLLER
Jerry I. Stafford, Levelland, Tex., assignor to Pan American Petroleum Corporation, Tulsa, Okla., a corporation of Delaware
Filed Aug. 28, 1969, Ser. No. 853,900
Int. Cl. F04b *49/02, 49/06;* **F04d** *15/02*
U.S. Cl. 166—53 **2 Claims**



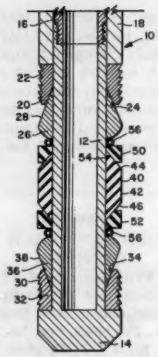
To obtain optimum production from a producing oil well in which the pump rate exceeds flow rate of liquid into the well, it is necessary to determine the most effective producing cycle of the well. During the "on" cycle the well must be pumped enough to obtain the maximum amount of well fluid. During the "off" cycle the fluid permeating through the formation rocks refills the well bore. The controller disclosed here is designed to stop the pump, preventing rod wear and expending excessive mechanical energy, when the fluid has been pumped from the well. The well pump is restarted only after a predetermined "off" time. It is a short-cycle controller of minimum cost, simple in operation, and easy to maintain. Wide flexibility in timing permits adjustment of the off and on cycles for best results.

3,559,732
HYDRAULIC LATCH STINGER
Andrew J. Tucker, Mesquite, Tex., assignor to Dresser Industries, Inc., Dallas, Tex., a corporation of Delaware
Filed Apr. 1, 1969, Ser. No. 811,824
Int. Cl. F21b *33/12, 23/00*
U.S. Cl. 166—114 **13 Claims**



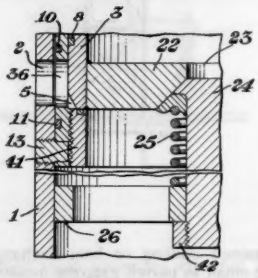
Disclosed herein is a releasable latching device for connecting a tubing string or conduit to a packer or other apparatus that is located in a well bore or the like. The latching device includes an elongated hollow body that has an upper end connected with the conduit and a lower end insertable into the apparatus that is located in the well bore. An annular or cylindrical member encircles the body and has a plurality of latching portions on the lower end thereof that are movable radially outwardly with respect to the body. A sleeve encircles the body between the cylinder member and body and includes a lower portion that is engageable with the latch portions to hold the latch portions in latching engagement with the apparatus. The sleeve is retained in engagement with the latch portions by hydraulic pressure within the conduit and within the cylinder. Movement of the sleeve out of engagement with the latch portion permits the latch portion to be moved inwardly and out of the recess in the apparatus whereby the tubing string can be disconnected from the apparatus.

3,559,733
WELL PACKERS
Marion D. Kilgore, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex., a corporation of Delaware
Filed May 1, 1969, Ser. No. 820,982
Int. Cl. E21b *33/129*
U.S. Cl. 166—134 **6 Claims**



A packing element support for well packers to prevent movement of the packing element between the anchoring means of the packer and the well bore, the support comprising an annular body with a gap therein and a curved member carried by said body bridging said gap. A well packer carrying at least one packing element support of this invention.

3,559,734
DIFFERENTIAL FILL COLLAR
Charles A. Pitts, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware
Filed Sept. 19, 1968, Ser. No. 760,830
Int. Cl. F16k *13/04;* **E21b** *41/00*
U.S. Cl. 166—224 **2 Claims**



This invention relates to a well casing collar into which is built a sliding collar type valve which is opened by fluid pres-

sure on the exterior when such pressure exceeds that on the interior by a predetermined amount. The valve, which is spring loaded, closes when the exterior pressure no longer exceeds the interior pressure.

3,559,735

METHOD OF RECOVERING OIL USING PELLETED CARBON BLACK CONTAINING SURFACTANT

Myron L. Corrin, Fort Collins, Colo., assignor to Phillips Petroleum Company, a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 688,651, Dec. 7, 1967, now abandoned. This application July 28, 1969, Ser. No. 845,543

Int. Cl. E21b *43/22*

U.S. Cl. 166—275 7 Claims

Flocculent carbon black is pelleted with one or more liquid surfactants and the resulting pellets are transported to the well site, disintegrated, mixed with water to form a stable dispersion, and a slug of the resulting dispersion is injected through a well into an oil stratum and driven toward an offset well to produce oil therein.

3,559,736

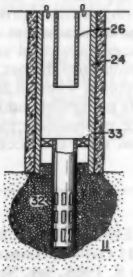
WELL COMPLETION METHOD

Caurino C. Bombardieri, Calgary, Alberta, Canada, assignor to Esso Production Research Company, a corporation of Delaware

Filed Sept. 12, 1969, Ser. No. 857,460

Int. Cl. E21b *43/04*

U.S. Cl. 166—276 17 Claims



A method of completing wells in unconsolidated formations by forming a temporary consolidated zone in the formation. The consolidated zone provides a relatively rigid framework which facilitates drilling operations and location of production equipment. With the production equipment located, the consolidated zone is returned to its original unconsolidated condition.

3,559,737

UNDERGROUND FLUID STORAGE IN PERMEABLE FORMATIONS

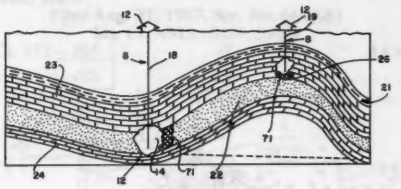
James F. Ralstin, and Jack H. Heathman, 672 Union Center Building, Wichita, Kans.

Filed May 6, 1968, Ser. No. 726,720

Int. Cl. E21b *33/138, 43/26*

U.S. Cl. 166—281 10 Claims

Fractures in caprocks of fluid storage reservoirs can be sealed and flow barriers can be established at desired regions of porous rocks by locally freezing the formation water to form an impervious cryogenic structure and/or by forming gas hydrates by contacting hydrate forming gases with formation water subjected to heat removal therefrom and agitation, for the purpose of stored fluid leakage control, increasing storage volume of limited reservoirs, and formation of storage conditions in homoclines and monoclines.



3,559,738

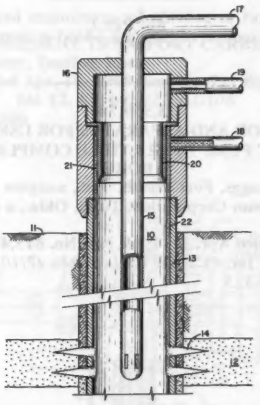
TECHNIQUE FOR STEAM INJECTION

Arthur G. Spillette, Houston, Tex., assignor to Esso Production Research Company, a corporation of Delaware

Filed Mar. 3, 1969, Ser. No. 803,865

Int. Cl. E21b *43/24*

U.S. Cl. 166—303 8 Claims



This invention relates to a method for thermally insulating a well used in a thermal process for oil recovery. The well is insulated by a falling film of liquid which is introduced at the well head in the annular space between the casing and the tubing. The film coats the internal surface of the casing to reduce the transfer of heat from the tubing string to the casing string and to conduct heat to an oil-bearing formation.

3,559,739

METHOD AND APPARATUS FOR PROVIDING CONTINUOUS FOAM CIRCULATION IN WELLS

Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif., a corporation of Delaware.

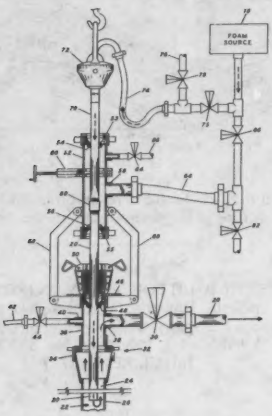
Filed June 20, 1969, Ser. No. 835,268

Int. Cl. E21b *33/02, 21/00*

U.S. Cl. 166—311 6 Claims

A method and apparatus is disclosed for maintaining continuous circulation of foam in a well through a segmented tubing string while the tubing string is being made up or broken up. A chamber having a foam entry port is formed around the tubing string above the wellhead. A valve is provided above the foam entry port to close off the upper portion of the chamber when the tubing string is broken and the upper portion thereof raised above such valve. When it is desired to add or remove a tubing section from the tubing string, the tubing string is held by slips with its open end in

the lower portion of the chamber. The upper tubing section is lifted in the chamber to above the valve. The valve is closed and foam is circulated in the chamber through the



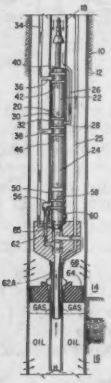
foam entry port to provide for continuous foam circulation while another section of tubing is added or removed from the tubing string.

3,559,740

METHOD AND APPARATUS FOR USE WITH HYDRAULIC PUMP IN MULTIPLE COMPLETION WELL BORE

Wilburt T. Scaggs, Fort Worth, Tex., assignor to Pan American Petroleum Corporation, Tulsa, Okla., a corporation of Delaware

Filed Apr. 11, 1969, Ser. No. 815,475
Int. Cl. E21b *43/14*; **F04b** *47/10*
U.S. Cl. 166—313 **3 Claims**



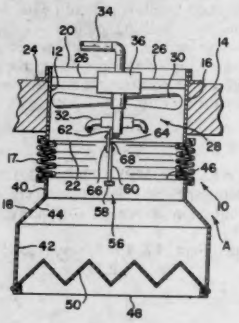
A pump system for removing oil from a well bore which has two vertically spaced-apart production zones. A packer is set in the well between these two zones. Three different selector heads are attachable to the lower end of the pump. A first head is for directing the commingled flow from the two zones to the intake of a single downhole pump. A second selector head is attached when it is desired to produce from the upper zone only and a third head is attached when it is desired to produce from the lower zone only. Each head contains removable chokes for controlling the production from each zone. The entire pump, including its selector head, is pumped in and out by hydraulic fluid.

3,559,741

FOAM GENERATING APPARATUS

Murray N. Levy, Hatfield, Pa., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich., a corporation of Delaware, by mesne assignments

Filed Aug. 8, 1968, Ser. No. 751,133
Int. Cl. A62c *35/00*
U.S. Cl. 169—15 **4 Claims**



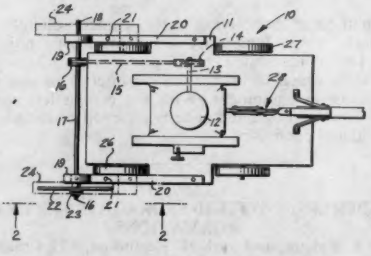
A foam generating apparatus of the type including an air duct forming unit having a foam producing net connected across the free passage area adjacent a first end, an airflow producing means adjacent a second end, and means for introducing a foam solution onto the net. The apparatus is provided with the improvement wherein at least a portion of the air duct forming unit is collapsible and, condition responsive means are provided for maintaining the duct forming unit in the collapsed condition until the occurrence of a predetermined condition.

3,559,742

EDGER DEVICE

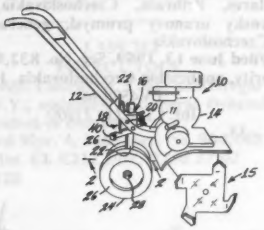
Joe B. Rogillio, Sr., 2211 Oxford, Houston, Tex. 77008

Filed July 8, 1968, Ser. No. 743,229
Int. Cl. A01b *9/00*
U.S. Cl. 172—15 **3 Claims**



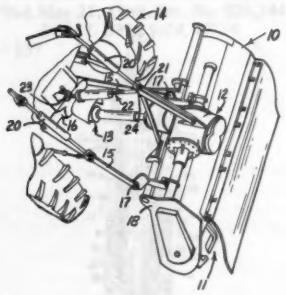
A device for edging lawns, yards, sidewalks, and driveways having a belt driven shaft which is mounted in variance, the shaft receiving threadably at each end an edger blade. The edger blade is secured to the shaft by a threaded nut. A fender is also carried upon the platform of the edger for safety reasons.

3,559,743
HANDLE HEIGHT ADJUSTMENT FOR CULTIVATORS
Paul F. Hastings, 5509 N. Market St., Spokane, Wash. 99207
Filed Jan. 8, 1968, Ser. No. 696,351
Int. Cl. A01b *33/00*
U.S. Cl. 172—43 2 Claims



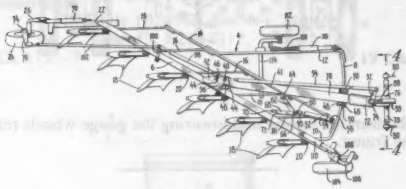
A handle height adjustment for attachment to a garden cultivator having a frame, a tiller and a motor driving said tiller, both mounted on said frame and a handle disposed above said frame, said Handle Height Adjustment comprising a pair of wheels mounted on an axle having an upright attached thereto, together with a support mounted on the cultivator frame and having guide means supporting said upright for vertical sliding movement. A cam is mounted on a shaft pivoted to the support. This shaft has attached to it a spring arm and a spring acting between said arm and said case urges the cam into engagement with the upright to hold the cam in an adjusted position. A foot operated release arm fixed to the shaft serves to hold the spring in cam releasing position to permit adjustment of the upright to vary the height of the handle above the ground and safety locking means retains the cam in engaged positions relative to the upright.

3,559,744
HITCH FOR ROTARY CULTIVATOR
James D. Olinger, 4912 N. Sipple, Spokane, Wash. 99206
Filed July 12, 1968, Ser. No. 744,443
Int. Cl. A01b *33/02, 61/00, 59/043*
U.S. Cl. 172—47 4 Claims



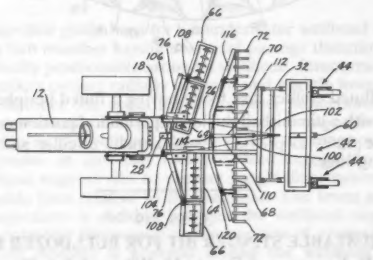
A hitch improvement for a rotary cultivator of the type including a rotatable blade assembly powered by a supporting tractor so as to rotate the lower portion of the blade assembly in a rearward direction during forward movement of the tractor. The present improvement provides an extensible linkage which permits the cultivator frame to swing forwardly upon engagement of an obstruction by the rotating blade. The hitch is biased by a spring which normally retains the hitch assembly and cultivator in the required conventional configuration.

3,559,745
MULTIPLE BOTTOM PLOW
Howard G. Thompson, Livonia, and Ole J. Thorsrud, Dearborn Heights, Mich., assignors to Massey-Ferguson, Inc., Detroit, Mich.
Filed Aug. 31, 1967, Ser. No. 664,681
Int. Cl. A01b *69/08, 59/02*
U.S. Cl. 172—285 5 Claims



A multiple bottom plow including a frame having a hitch member which is pivotally connected to the frame so that the position of the plow relative to the tractor can be laterally shifted. A hydraulic ram is interconnected between the frame and hitch member for adjusting the position of the hitch member.

3,559,746
IMPLEMENT TRANSPORT CARRIER
Chester F. Couser, Zearing, Iowa
Filed Apr. 16, 1968, Ser. No. 721,812
Int. Cl. A01b *63/22, 63/106*
U.S. Cl. 172—386 5 Claims

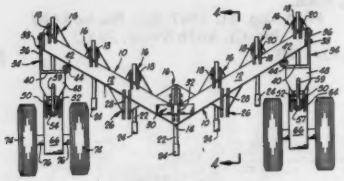


A device for carrying a plurality of ground working implements in tandem and in series. The device is secured at its forward end to the parallel lift arms of a tractor and to a caster wheel at its rear end through a parallelogram structure which has a hydraulic cylinder connected to it for raising and lowering the rear end relative to the caster wheel. A cable arrangement is provided for pivoting upwardly the wing units on the implements as the implements are raised above the ground. A versatile hinge arrangement is provided for connecting the wing units to the center implement units and the hinge devices have other uses in connecting the implements to the tractor prime mover.

3,559,747
DEEP TILLAGE PLOW
Ted L. Ciine, P.O. Box 38, Rush Springs, Okla. 73082
Filed May 15, 1968, Ser. No. 729,358
Int. Cl. A01b *63/16*
U.S. Cl. 172—421 5 Claims

A plow which includes a V-shaped frame, a plurality of blade supporting brackets secured to the frame and spaced from each other therealong, an arcuate, forward sweep toothed blade secured to each of said brackets, and a pair of gauge wheel assemblies secured to the opposite ends of the

frame. The gauge wheel assemblies are detachably mounted on the frame, and each includes a screw jack adjusting



mechanism for raising and lowering the gauge wheels relative to the frame.

3,559,748

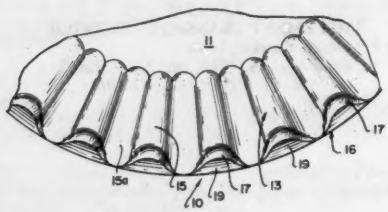
FLUTED COULTER DISC BLADE

Lee E. Shelton, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill., a corporation of Delaware

Filed July 18, 1968, Ser. No. 745,765

Int. Cl. A01b *23/06*

U.S. Cl. 172—604 **2 Claims**



A fluted coulter disc blade having a fluted peripheral portion with a diminished thickness peripheral portion outwardly of the flutes to provide a substantially circular and straight cutting edge.

3,559,749

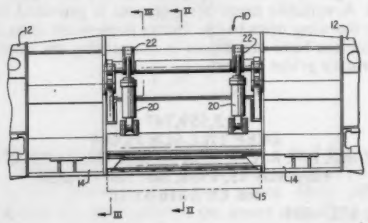
ADJUSTABLE STINGER BIT FOR BULLDOZER BLADE

Max D. Fryrear, and Eugene M. Wilson, Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill., a corporation of California

Continuation of application Ser. No. 708,566, Feb. 27, 1968, now abandoned. This application Jan. 26, 1970, Ser. No. 6,051

Int. Cl. E02f *3/76;* **A01b** *65/06*

U.S. Cl. 172—802 **6 Claims**



A stinger bit on a bulldozer blade which is retractable to a point where its cutting edge aligns with the cutting edges of bits on opposite sides of the stinger bit so that the bits combine to provide what is in effect a straight cutting edge on a conventional bulldozer and particularly, a support and adjusting means for such a bit which is simple and compact.

3,559,750

SUPPORTING MEANS FOR A MOBILE PERCUSSIVE ROCK DRILL FOR CARRYING OUT CYLINDRICAL CUTS

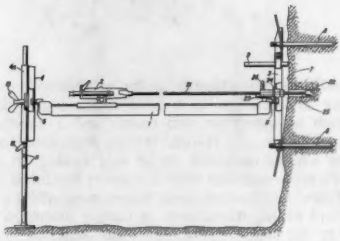
Vladimir Mares, Pribram, Czechoslovakia, assignor to Ceskoslovensky uranovy prumysl, generalni reditelstvi, Pribram, Czechoslovakia

Filed June 13, 1969, Ser. No. 832,923

Claims priority, application Czechoslovakia, June 19, 1968, PV4509/68

Int. Cl. E21c *11/00*

U.S. Cl. 173—33 **2 Claims**



A percussive type rock drill is in the course of carrying out substantially horizontal holes for a cylindrical cut in the rock face supported by a support, which is suspended by means of suspension heads on both extremities of said support in cutouts of guiding grooves of a stable pattern fixed on the rock face and of an adjustable pattern mounted on a mounting pillar. Holes for the drill bit of the rock drill are provided above each cutout of said guiding grooves.

3,559,751

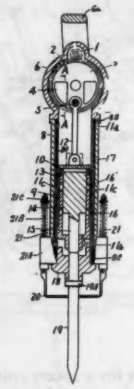
PERCUSSION DEVICE

Sakuji Yamada, 1-5, 3-chome, Kitanagasdori, Ikutaku, Kobe, Japan

Filed Jan. 16, 1969, Ser. No. 791,741

Int. Cl. B25d *11/12*

U.S. Cl. 173—116 **3 Claims**



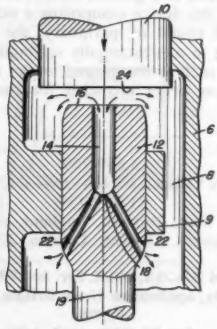
A lightweight percussion device operating from a motor driven crank which reciprocates a hollow inner cylinder closed at both ends and slidably mounted in an outer cylinder with a piston having a rod extending through one end of the inner cylinder and slidably mounted in the inner cylinder; a set of ports are provided adjacent each end of the inner cylinder and spaced from the adjacent end of the inner

cylinder and one set of ports spaced from the other ports a distance in the order of the throw of the crank with the ports communicating with the atmosphere so that rotation of the crank causes reciprocation of the inner cylinder and the confined gas between the end of the piston and the adjacent end of the inner movable cylinder causes the piston to reciprocate while the piston is cushioned at each end of its movements and the rod projecting from the piston serves to produce a hammering action on a gad or other tool.

3,559,752
IMPACT TOOL

Donald N. Sullivan, Lakewood, Colo., and Gregory A. Farrell, New York, N.Y., assignors to General Dynamics Corporation, a corporation of Delaware

Filed Mar. 4, 1969, Ser. No. 804,168
Int. Cl. E21c *2/04*; **B25d** *17/02*
U.S. Cl. 173—128 **8 Claims**

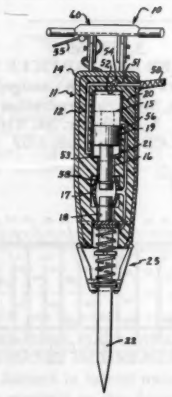


An improved anvil for an impact tool is described which is especially suitable for use in a percussive tool which utilizes a hammer and anvil, both of which are surrounded by an oil bath. The anvil has a blind center hole which is vented in such a fashion so as to reduce cavitation damage at the contacting surfaces of the hammer and anvil.

3,559,753
PERCUSSION TOOL

Ilmar Meri, 63 Brainard Ave., Port Monmouth, and Richard J. Dorsey, 140 Ocean Ave, East Keansburg, N.J.

Filed May 21, 1969, Ser. No. 826,344
Int. Cl. B25d *9/04*, *17/24*
U.S. Cl. 173—137 **5 Claims**

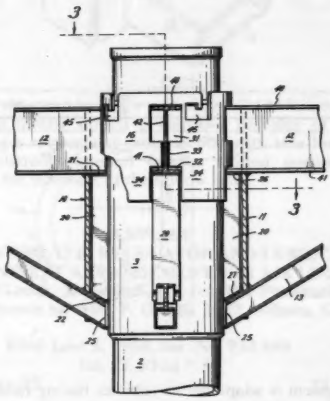


A percussion tool such as an air hammer having a spring-supported mounting for the operating chisel in which said chisel is adjustably affixed to the center of said spring to permit a setting for an ideal cyclic rhythm of tool operation and in which the tool has sound deadening or absorption components throughout the tool to provide a minimum of noise during operation.

3,559,754
REMOVABLE GUIDE BASE

Charles D. Morrill, Bellaire, Tex., assignor to Rockwell Manufacturing Company, Houston, Tex., a corporation of Pennsylvania

Filed July 10, 1968, Ser. No. 743,699
Int. Cl. E21b *7/12*, *7/00*
U.S. Cl. 175—7 **19 Claims**

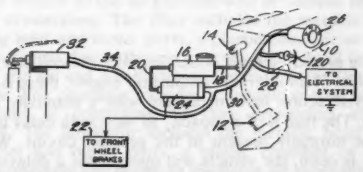


A removable guide base for an underwater wellhead comprising a hub member having a vertical passage therethrough telescopically positionable around a wellhead. Structural support members project radially outward and slightly inward of the hub member. An upper set of the inner projections provides a downwardly facing support surface engageable with support ribs on the wellhead. A lower set of the inner projections provides an upwardly facing surface engageable with the wellhead support ribs to prevent longitudinal movement of the guide base relative to the wellhead. The lower set of inner projections is slidable between the wellhead support ribs and rotatable thereunder to the position of engagement as the hub member is lowered around the wellhead and rotated. A latch sleeve is nonrotatingly mounted within the hub member for longitudinal movement between adjacent wellhead ribs to prevent disengagement of the lower set of inner projections. Methods for using the guide base are also disclosed.

3,559,755
VEHICLE ANTITHEFT DEVICE

Raymond B. Pond, 195 Springfield Ave., Greenfield Park, Quebec, Canada

Filed Aug. 22, 1968, Ser. No. 754,548
Int. Cl. B60r *25/00*
U.S. Cl. 180—114 **13 Claims**



An antitheft device for automobiles which includes a control valve interrupting the conduit from the master cylinder

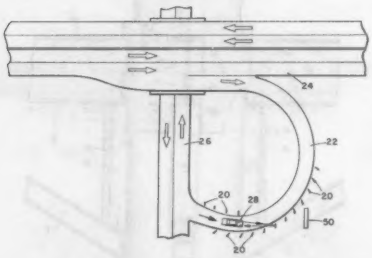
to a set of wheel brakes. The control valve includes inlet and outlet ports from the master cylinder communicating with a bore, a sliding solenoid-controlled plunger in the bore, a valve head connected to the plunger adapted to allow pressure flow to the brakes, but to prevent pressure flow back to the master cylinder when the control valve is in a locked position.

3,559,756

WRONG WAY TRAFFIC CONTROL SYSTEM

Noel M. Torres, 1853 Ridgewood Drive, San Diego, Calif. 92139

Filed Mar. 10, 1969, Ser. No. 805,637
Int. Cl. B60t *7/12*; **G01s** *9/02*; **B60k** *77/08*
U.S. Cl. 180—98 **6 Claims**



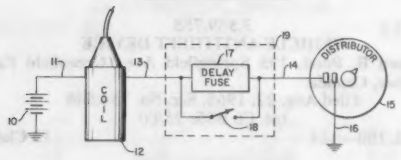
The system is adaptable to vehicles having radiant energy proximity detecting or automatic spacing apparatus. A series of fixed radiant energy reflectors is placed along the side of a one-way traffic lane to reflect signals back to a wrong way vehicle and warn or stop the vehicle. A simple addition to the basic proximity detecting apparatus locks the brakes until the vehicle is reversed.

3,559,757

AUTOMOBILE THEFT PREVENTION DEVICE

Hans R. Weiss, Niles, and Joseph G. Baran, Northbrook, Ill., assignors to Taroda Industries, Inc., Chicago, Ill., a corporation of Illinois

Filed Jan. 29, 1968, Ser. No. 701,332
Int. Cl. B60r *25/00*
U.S. Cl. 180—114 **5 Claims**



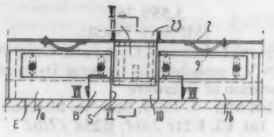
In the primary circuit, which includes the coil and distributor points of an internal combustion engine, there is inserted a delayed action fuse in parallel with a manually operable switch. The fuse is of a capacity to blow with delay under the current normally present in the primary circuit. When the switch is open, the vehicle will operate for a delayed period before the fuse blows and disables the engine. With the switch closed, the engine may be operated whether or not the fuse is blown.

3,559,758

FLUID CUSHION CONFINING DEVICE

Jean Henri Bertin, Neuilly-sur-Seine, France, assignor to Bertin & Cie, Plaisir, France, a company of France

Filed June 27, 1968, Ser. No. 740,653
Claims priority, application France, Aug. 22, 1967, 118,640
Int. Cl. B60n *1/04*
U.S. Cl. 180—116 **10 Claims**



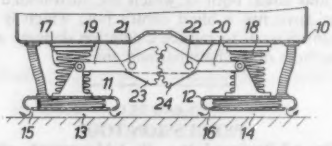
A device, applied to a ground effect vehicle, for confining a fluid cushion, the device comprising a sidewall for bounding the cushion round its periphery, the free end of the sidewall bearing in a substantially sealingtight manner on a bearing surface such as the ground, outlet means of adjustable cross section being provided for the fluid from the cushion.

3,559,759

AIR CUSHION VEHICLES HAVING INCREASED ROLL STIFFNESS

William Barrie Hart, Burwell, England, assignor to Hovercraft Development Limited, London, England, a British company

Filed Nov. 18, 1968, Ser. No. 776,587
Claims priority, application Great Britain, Dec. 20, 1967, 57,798
Int. Cl. B60v *1/02*, *1/00*
U.S. Cl. 180—118 **10 Claims**



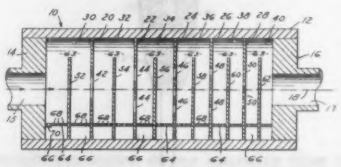
The invention relates to an air cushion vehicle in which the cushions on opposite sides of the vehicle are so interconnected that if the vehicle rolls to one side then the air cushion on the other side is automatically lifted up to produce a righting moment to correct the roll.

3,559,760

VEHICLE MUFFLER AND PARTICLE SEPARATOR

Jack S. Ninomiya, Rockwood, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

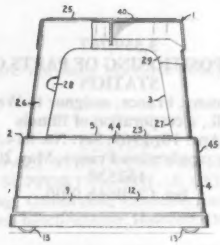
Filed Mar. 3, 1970, Ser. No. 016,162
Int. Cl. F01n *1/08*, *3/02*
U.S. Cl. 181—36 **9 Claims**



Engine exhaust gases enter a series of chambers through succeeding partitions containing orifices of decreasing size

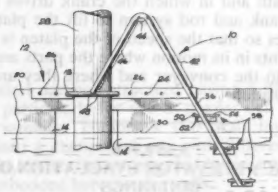
but increasing numbers. A baffle is located in each chamber downstream of its inlet orifices to change the flow direction of the exhaust gases in such a manner that particulate matter carried by the exhaust gases drops to the bottom of the chamber. The bottom of each chamber contains a false floor having openings therein and the particulate matter drops through the openings into storage compartments.

3,559,761
COMBINED STEP AND STOOL
Norvin J. Wehner, Kansas City, Mo., assignor to Cramer Industries, Inc., Kansas City, Kans., a corporation of Missouri
Filed July 1, 1969, Ser. No. 838,232
Claims priority, application Germany, June 19, 1968, 1,767,795
Int. Cl. E06c *1/397*
U.S. Cl. 182—15 **6 Claims**



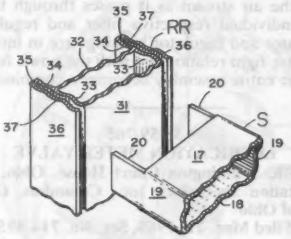
This invention is directed particularly to a combined step and stool wherein the stool member is removably attached to the step member, whereby the stool can be removed from the step member and used independently thereof.

3,559,762
SAFETY LADDER FOR WATER USE
Kenneth L. Thompson, Huntington Beach, Canada, assignor to Ye Dock Master, Inc., a corporation of California
Filed Sept. 26, 1969, Ser. No. 861,328
Int. Cl. E06c *1/39*
U.S. Cl. 182—93 **10 Claims**



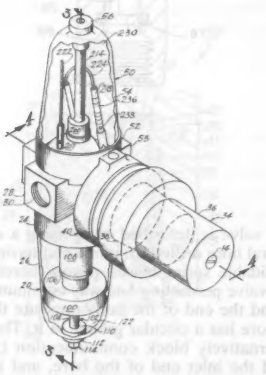
A safety ladder for use in water in combination with a pile extending above the surface of the water and a floating structure. The floating structure includes means for encircling the pile to be thereby limited in lateral movement. At least one of the side rails is secured to the floating structure and at least one of the side rails is secured to the pile encircling means.

3,559,763
LADDER STRUCTURE
Melvin J. Stern, Miami, Fla., assignor to Lawnlite Company, Miami, Fla., a corporation of Florida
Filed Oct. 27, 1969, Ser. No. 869,486
Int. Cl. E06c *7/08*
U.S. Cl. 182—215 **4 Claims**



A ladder structure having a pair of parallel hollow rails, the hollow rails having slotted portions, a plurality of hollow steps having a rectangular cross section with tabs formed at the ends thereof received by the slotted portions and fastened to the sidewalls of the hollow rails.

3,559,764
SELECTIVE FILTER, REGULATOR AND LUBRICATOR COMPONENT ARRANGEMENT FOR AIR LINES
Harry L. Wheeler, Jr., Fulton, Ga. (c/o DK Pneumatics Inc., 1090 Jefferson St. NW, P. O. Box 2427, Atlanta, Georgia, 30318)
Filed June 5, 1968, Ser. No. 734,664
Int. Cl. F16n *7/34*
U.S. Cl. 184—55 **22 Claims**



The air filter, the air regulator and the air lubricator, one or more of which are used in compressed air lines, such as those driving power tools, each having its own housing which may be selectively connected to one or more of the other housings to provide either a vertical or horizontal arrangement with respect to the air line axis with or without the use of fitting connections. The filter includes the metallic head containing inlet and outlet ports, a plastic chamber or bowl and a foraminous device therein to remove entrained impurities from the air and a collector to separate water from the air stream. The regulator includes a metallic casting with a valve means of controlling air flow responding to the diaphragm. The lubricator includes the metallic head containing inlet and outlet ports, a plastic chamber or bowl defining a reservoir and means to discharge oil vapor into the outlet port at a prescribed rate. By selective fitting of the housings together, communication is established through the

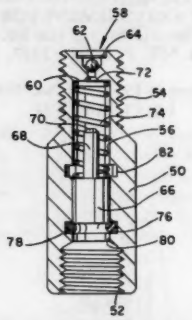
inlets and outlets already provided therein and means is provided for securing the selected filter, or regulator or lubricator together. The respective housings interlock and nest together in different relationships to fit into existing spaces or to save space.

In the lubricator arrangement, the volume of the lubricator bowl, which may be plastic, metal or other suitable material, is used as oil reservoir and means is provided to inject a spray of oil into the air stream as it passes through the housing. When the individual respective filter and regulator or the filter lubricator and regulator housings are in intimate, combined pressure-tight relationship with the bowls for lubricator and filter, the entire assembly becomes a combined housing.

3,559,765
LUBRICATION METER VALVE

Roy B. Smith, Washington Court House, Ohio, assignor to Transportation Specialists, Inc., Columbus, Ohio, a corporation of Ohio

Filed Mar. 21, 1968, Ser. No. 714,895
Int. Cl. F16n *27/00*
U.S. Cl. 184—7 **2 Claims**



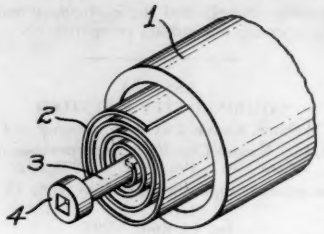
A meter valve is described comprising a cylindrical body with a central bore drilled from one end having a cooperating sealingly slidable spring-biased piston therein and having a ball check valve permitting one-way communication between the bore and the end of the body opposite the open or inlet end. The bore has a circular groove in it. The piston is slidable to alternatively block communication (1) between the groove and the inlet end of the bore, and (2) between the groove and the ball check valve. Movement of the piston away from the ball check valve creates a substantial vacuum which is used to boil lubricant out of the groove and eventually force it out through the check valve.

3,559,766
HEAT RECOVERABLE ARTICLE WITH MECHANICAL INSERT

William Rosse Heslop, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif., a corporation of California

Continuation-in-part of application Ser. No. 591,836, Nov. 3, 1966, now abandoned. This application Oct. 30, 1968, Ser. No. 790,892
Int. Cl. F03g *1/00*
U.S. Cl. 185—39 **4 Claims**

Heat recoverable articles adapted to operate upon an object in which a heat recoverable sleeve is disposed about spiral spring means inserted in and substantially coaxial with said sleeve, recovery of the sleeve causing contraction of the spring means and transmission of the force exerted by

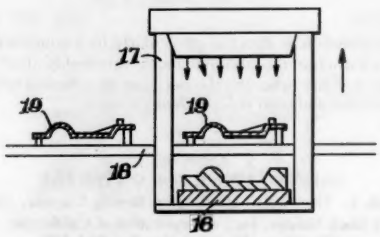


recovery to a member engageable with the inner end of said spring means.

3,559,767
DEVICE FOR POSITIONING OF PARTS ON A WORK STATION

Rene Gervais, Santeny, France, assignor to Welding Research, Inc., Chicago, Ill., a corporation of Illinois

Filed Apr. 10, 1969, Ser. No. 814,956
Claims priority, application France, May 20, 1968, P.V. 152530
Int. Cl. B66b *9/00*
U.S. Cl. 187—1 **4 Claims**



A device for raising and lowering a work piece from conveyor to work station which consists of a planetary gear system with crank arrangement which describes an epicycloidal path and in which the crank drives a push rod and second crank and rod system to lift the platen holding the work pieces so that the speed of the platen is reduced at the critical points in its motion where the parts are picked up and returned to the conveyor and where they are placed in the working position.

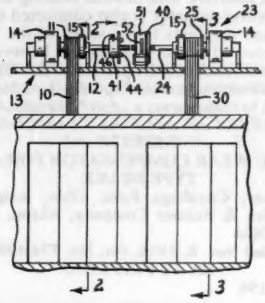
3,559,768
EMERGENCY ELEVATOR EVACUATION OF TALL BUILDINGS

Henry P. Cox, 8 Banner Apts., 1425 SW. Clay St., Portland, Oreg. 97207

Filed Dec. 22, 1969, Ser. No. 887,134
Int. Cl. B66b *11/04*
U.S. Cl. 187—20 **5 Claims**

Means are provided for connecting together the hoist rope traction sheaves of two elevators in the event of power failure. The hoist ropes for one elevator pass around guide sheaves to reverse their normal direction of wrap on the traction sheave so that the two elevators travel in opposite directions when their traction sheaves are connected together. Thus, each descent of a loaded car will pull up an

empty car whereby a building may be evacuated by the gravity operation of two elevators without electrical power. The



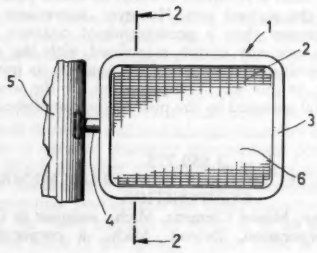
two elevators are normally operable independently of each other.

3,559,769

SATELLITE WALL STRUCTURE PARTICULARLY FOR SUPPORTING SOLAR CELL

Erich Arbeitlang, Ottobrunn, Germany, assignor to Bolkow Gesellschaft mit beschrankter, Haftung, Ottobrunn, Munich, Germany

Filed Aug. 22, 1968, Ser. No. 754,699
Claims priority, application Germany, Aug. 25, 1967, P1,531,555
Int. Cl. F16f *7/10*
U.S. Cl. 188—1 **10 Claims**



A vibration damped structure having a double wall construction, particularly for use as a solar cell supporting surface for satellites comprises two wall layers which are clamped into a clamping frame with different initial stress. The wall layers are interconnected by an intermediate filler material imbedded between the walls.

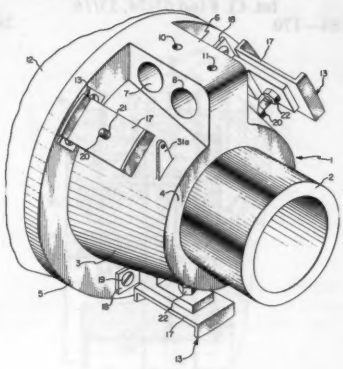
3,559,770

DRUM BRAKE INCLUDING AXLE AND ACTUATING CYLINDER DETAIL

Carl E. Bricker, Cuyahoga Falls, and Kenneth P. Hillegass, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio, a corporation of Ohio

Filed Feb. 10, 1969, Ser. No. 797,803
Int. Cl. B60t *1/06*
U.S. Cl. 188—152.82 **6 Claims**

A brake having a rotary drum and a stationary axle with an integral cylinder housing. A thickened portion is provided at a desired position on the axle to form the cylinder housing in which one or more cylinders may be located. When the



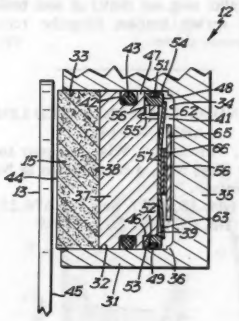
brakes are applied, the torque from the rotating drum is transmitted through the integral cylinder housing to the axle.

3,559,771

BRAKE MOTOR

Robert L. Crane, Hopkins, Minn., assignor to Tol-O-Matic, Inc., Minneapolis, Minn., a corporation of Minnesota

Filed July 2, 1968, Ser. No. 741,928
Int. Cl. F16d *55/18, 65/54*
U.S. Cl. 188—71.8 **9 Claims**

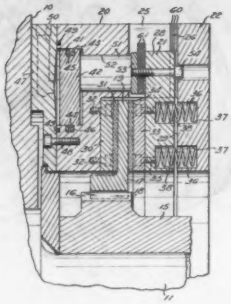


The improved brake motor of the present invention is actuated by fluid under pressure so as to force a brake puck into contact with an adjacent surface of a relatively moving disc to brake or reduce the speed of the disc. The brake motor includes a piston which is positioned for reciprocal movement within a cylinder formed in the motor housing, which carries the brake puck and which is moved in response to pressure of the fluid in a pressure chamber defined in the cylinder. The motor also includes a drag ring secured within the cylinder by a resilient member which is tightly wedged between the periphery of the drag ring and the cylinder. A leaf spring and limit plate assembly are carried by the piston and cooperate with the drag ring and the piston whereby the brake puck is positively moved away from and out of contact with the disc when the brake motor is not being actuated and whereby automatic compensation for wear on the brake puck is accomplished after a predetermined amount of wear has occurred.

3,559,772
SPRING APPLIED, FLUID PRESSURE RELEASED BRAKE

Walter J. Grombka, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio, a corporation of Ohio

Filed Sept. 24, 1968, Ser. No. 762,096
Int. Cl. F16d *65/24, 55/16*
U.S. Cl. 188—170 **26 Claims**

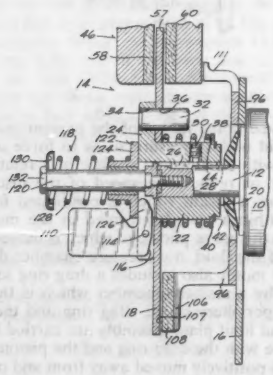


A disc brake for heavy machinery such as metal working presses and the like which includes a rotatable disc mounted on a projecting shaft for rotation with the shaft and for axial movement relative to the shaft. A stationary brake ring is mounted on the frame of the machine and has a face adjacent to one side of the disc. The other side of the disc faces an axially movable brake ring which is locked to the stationary brake ring to prevent relative rotation therebetween. A cover plate is fixed to the stationary brake ring. Springs are provided between the cover plate and the axially movable brake ring to bias the brake against the disc to thereby apply braking pressure to the shaft and fluid motor means are provided to overcome the bias of the springs to thereby release the brake. Shims are provided between the cover plate and the stationary brake ring so that, as the braking surfaces wear, the initial spring tension may be reestablished by removing one or more shims.

3,559,773
BRAKE AND AUTOMATIC SPEED LIMITER ARRANGEMENT

Thomas H. Hock, Milwaukee, Wis., assignor to AMF Incorporated, Jersey City, N.J., a corporation of New Jersey. by mesne assignments

Filed Oct. 18, 1967, Ser. No. 676,251
Int. Cl. B60t *7/12, 13/08*
U.S. Cl. 188—187 **9 Claims**

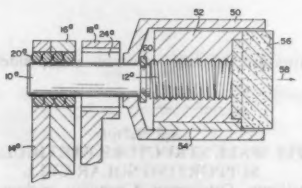


This disclosure relates to a combination brake and speed limiting mechanism wherein a manually operated brake operates on a rotatable brake disc to produce selective braking action. The disc is connected to a source to be braked so that braking action is transmitted to the source. An additional brake friction pad, that is in addition to the friction pads of the manual brake assembly, is supported adjacent the brake disc and is normally disengaged from the brake disc so that it does not interfere with manual braking action. A centrifugally responsive actuator is also connected to the source to be braked and responds to the speed of the source to effect, at a preselected speed, engagement between the brake disc and the additional friction pad and a friction pad of the manual brake assembly to retard speed.

3,559,774
AUTOMATIC WEAR COMPENSATOR FOR A SCREW-TYPE BRAKE

Carl E. Bricker, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio, a corporation of Ohio

Filed Nov. 8, 1968, Ser. No. 774,438
Int. Cl. F16d *65/56*
U.S. Cl. 188—196 **8 Claims**

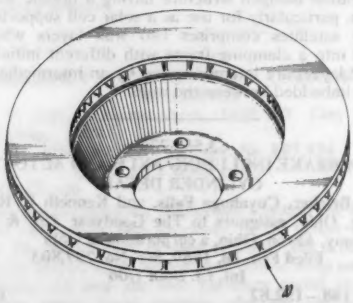


An automatic friction lining compensator adaptable to a screw-type brake applied either mechanically or by springs. Essentially, a shaft having a screw on one end threadably received in the piston causes movement of the piston upon rotation of the shaft. Rotation is imparted to the shaft by an arm operating through a one-way clutch. The arm is returned to its initial position after actuation of the brake. A second arm is connected to the shaft through a one-way clutch operating in the reverse direction to that associated with the first arm. The shaft is returned towards its initial position by movement of the second arm. However, movement of the second arm greater than a predetermined distance causes release of the one-way clutch associated with the second arm, thereby limiting the return of the shaft to its initial angular position. In this way, compensation for the wear of a friction material actuated by the piston is accomplished.

3,559,775
HYPEREUTECTIC GRAY IRON BRAKE MEMBER COMPOSITION

Edwin J. Miller, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

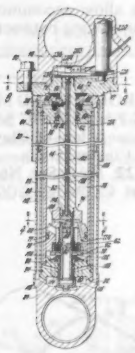
Filed Apr. 1, 1968, Ser. No. 717,669
Int. Cl. F16d *69/02*
U.S. Cl. 188—251 **6 Claims**



In a preferred form of the invention a disc brake rotor is disclosed which is formed of a hypereutectic gray iron com-

position having a relatively high capacity for damping mechanical vibrations, excellent wear resistance and high thermal conductivity. The composition is a pearlitic gray iron having a carbon equivalent of at least 4.5. Carbon is present in combined form in pearlite and as ASTM Type-A flake graphite.

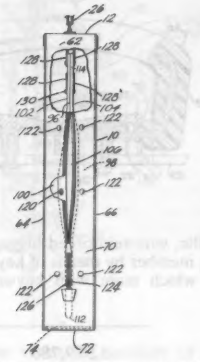
3,559,776
SHOCK LOCKOUT AND PISTON SYSTEM
Harold E. Schultze, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware
Filed June 17, 1969, Ser. No. 833,956
Int. Cl. F16f *9/10*
U.S. Cl. 188—88 **6 Claims**



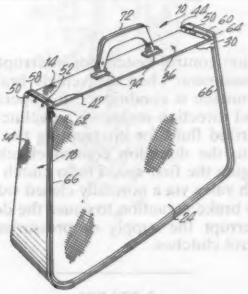
In preferred form, a direct acting hydraulic shock absorber including a reciprocal piston which has a valve element normally maintained in a closed position by a spring and movable to an open position to regulate fluid flow between rebound and compression chambers in response to a predetermined pressure in the chambers. The valve element has a small diameter end and a larger diameter end integrally joined by a variable diameter intermediate portion. During normal shock absorber operation fluid pressure within the rebound chamber and the compression chamber acts against the intermediate portion and the small diameter end respectively of the valve element to move it to an open position against the force of the spring. A pilot valve in the piston is selectively rotated by reversible drive means between a normal and a lockout position. In the lockout position, fluid pressure in the rebound chamber and the compression chamber is transmitted by the pilot valve against the larger diameter and of the valve element. This pressure force counterbalances the aforementioned pressure forces on the small diameter end and the intermediate portion of the valve element to hold the valve in a closed position and consequently to prevent subsequent extension or contraction of the shock absorber.

3,559,777
LUGGAGE BAG
Keith L. Gardner, 143 N. Thompson, Jackson, Mich. 49202
Filed Feb. 10, 1969, Ser. No. 798,084
Int. Cl. A45c *3/00*; B65d *85/18*
U.S. Cl. 190—43 **6 Claims**

An elongated luggage bag adapted to be transported and stored depending from support means at its upper end, the bag having an outer bag portion which, in horizontal section, is of narrow rectangular form, there being an inner bag portion dividing the outer bag portion into front and rear hanger compartments accessible through the front and rear broad sides of the outer bag portion, the inner bag portion being accessible through one of the narrow sides of the outer bag portion.

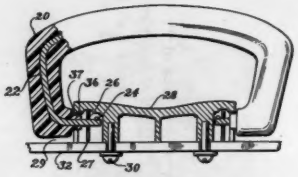


3,559,778
LUGGAGE CONSTRUCTION WITH EXTERIOR U FRAME
Anthony N. D'Elia, Riverdale, and Edward M. Stolarz, Yorktown Heights, N.Y., assignors to Reliable Luggage, Inc., West Pittsburgh, Pa., a corporation of Pennsylvania
Filed Jan. 8, 1969, Ser. No. 789,681
Int. Cl. A45c *13/04*
U.S. Cl. 190—49 **7 Claims**



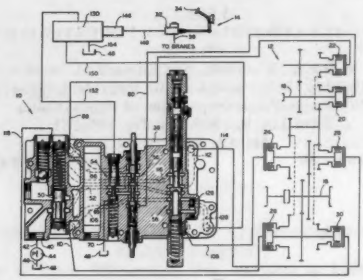
This invention relates to an article of luggage comprising a U-shaped frame means for forming the entire bottom and the entire sides of the article of luggage and a top frame member secured to the frame means. A pair of fabric panels are secured to the frame means and frame member for forming the front and back of said article of luggage and slide fastener closure means are disposed along the peripheral edge of one of said fabric panels for providing an access opening for the article of luggage.

3,559,779
KEYED LUGGAGE MEMBERS
Leon Lautin, 43 White Drive N, Cedarhurst, and Alton K. Allen, 11 Flower Lane, Great Neck, N.Y. 11024
Filed Nov. 29, 1968, Ser. No. 780,023
Int. Cl. A45c *13/26*
U.S. Cl. 190—58 6 Claims



A nonmetallic, wire-reinforced luggage handle is attached to a mounting member by means of keys on both ends of the handle wire, which mate with keyways in the mounting member.

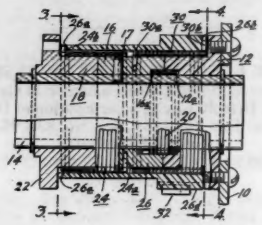
3,559,780
TRANSMISSION SYSTEM NEUTRALIZED BY BRAKE
William C. Erdman, Jackson, Mich., assignor to Clark Equipment Company, a corporation of Delaware
Filed Feb. 7, 1969, Ser. No. 797,565
Int. Cl. F16h *57/10*
U.S. Cl. 192—4 4 Claims



A transmission control system for interrupting power flow through a transmission when the vehicle brakes are applied and the transmission is conditioned for operation in a given speed ratio and direction including a declutch valve responsive to pressurized fluid for interrupting the supply of pressurized fluid to the direction control clutches. Pressurized fluid for engaging the first speed ratio clutch also is directed to the declutch valve via a normally closed valve which opens in response to brake actuation to cause the declutch valve to shift and interrupt the supply of pressurized fluid to the direction control clutches.

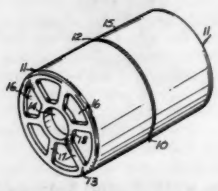
3,559,781
SPRING CLUTCH-BRAKE WITH ADJUSTABLE STOP COLLAR
Thomas T. Brunelle, Glassboro, N.J., assignor to Precision Specialties, Inc., Pitman, N.J., a corporation of Missouri
Filed Dec. 6, 1968, Ser. No. 781,762
Int. Cl. F16d *67/02*
U.S. Cl. 192—12 6 Claims

A stop collar for a clutch brake employs different numbers of slots at opposite edges to receive the end tangs of clutch and brake springs, respectively. Each of the springs is fixed to an output hub at its opposite end. The clutch spring tends to wrap down on an input hub, which it surrounds, in which position the brake spring is out of contact with a frame hub, which it surrounds. Relative rotation between the collar and the output hub will release the clutch spring and engage the brake spring. Slot arrangements with different numbers of



slots on opposite ends allow accommodation of springs no matter what the angular spacing between their end tangs.

3,559,782
CONVEYOR ROLLER AND METHOD OF MANUFACTURING SAME
Hubert G. Lesley, deceased, late of Clayton, Ga. by Kathryn W. Lesley, executrix, Clayton, Ga.
Filed Apr. 22, 1968, Ser. No. 729,484
Int. Cl. B65g *13/00*
U.S. Cl. 193—37 9 Claims



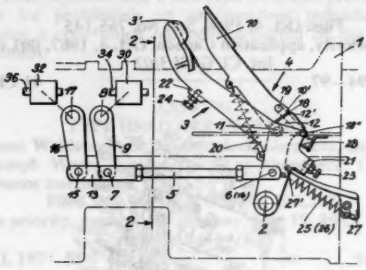
This invention relates to a conveyor roller for use in a logistic loading system for cargo aircraft and comprises two opposed extruded aluminum cup-shaped shells that are welded together along a common seam to provide a load bearing surface, each end having a central aperture for receiving therein an antifriction bearing member and a plurality of access apertures defined between said central aperture and said load bearing surface.

This invention further includes the method of manufacturing the conveyor roller designed for use in cargo aircraft, which method includes the steps of extruding cup-shaped shell members, punching apertures in the closed end of said shell members; welding two of said shell members together to form said roller; and anodizing the interior and exterior surfaces of said roller.

3,559,783
CLUTCH CONTROLS FOR TRACTOR VEHICLES
Herbert Haberzettl, Ebersbergestrasse 36, 8011 Hohenlinden, Germany, and Jean N. Logothetopoulos, Habsburgerstrasse 5, 8 Munich, 13, Germany
Filed May 15, 1969, Ser. No. 825,013
Claims priority, application Germany, May 15, 1968, 1,755,481
Int. Cl. G05g *13/00*
U.S. Cl. 192—48.7 7 Claims

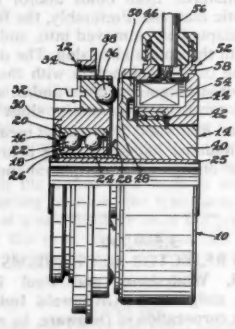
Provided for separate clutches in dual power drives in tractor or the like vehicles are separate foot pedals for actuating the respective clutches, with the pedals having followers of which each follower projects into the swing path of the other

pedal, and the followers being arranged so that on depression of either pedal through successive stages its associated clutch



is disengaged and the other pedal is taken along by the follower arrangement to disconnect the other clutch.

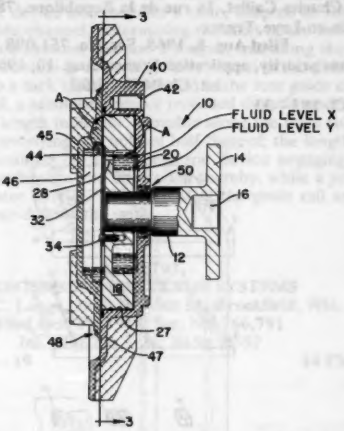
3,559,784
ELECTRIC OVERLOAD CLUTCH
Donald L. Miller, Horseheads, N.Y., assignor to The Bendix Corporation, a corporation of Delaware
Filed July 22, 1968, Ser. No. 746,523
Int. Cl. F16d *43/20, 27/10*
U.S. Cl. 192—56 **5 Claims**



An electromagnetic clutch having an overtorque triggered release which allows reengagement of the torque transmitting members without reducing clutch speed. When overload occurs, the initial slippage of the torque transmitting members cams them apart, reversing the spring-electromagnetic force balance to force the axially movable torque transmitting member away from the axially stationary torque transmitting member. Electrical switching means, sensitive to torque and speed, are also provided to change the state of current flow in the electromagnetic clutch.

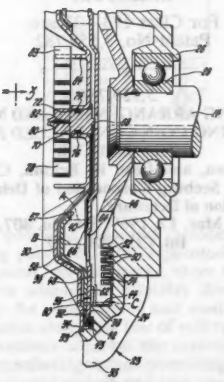
3,559,785
VARIABLE FLUID COUPLING
Thomas J. Weir, Indianapolis, Ind., assignor to Wallace-Murray Corporation, New York, N.Y., a corporation of Delaware
Filed Feb. 28, 1969, Ser. No. 803,157
Int. Cl. F16d *31/06, 31/08*
U.S. Cl. 192—58 **6 Claims**

A temperature responsive fluid coupling. The driven member is a housing adapted to carry a cooling fan for an internal combustion engine. The driving member is a disc having a storage chamber for friction fluid opening on one side of it. Grooves on the sides and periphery of the disc cause the friction fluid to continuously flow from one to the other side of the disc and through it. A temperature responsive ele-



ment acting as a valve varies the quantity of fluid passing between a drive chamber and storage area.

3,559,786
VISCOUS FLUID CLUTCH WITH COOLING PASSAGE MEANS
Paul J. Long, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware
Filed Apr. 30, 1969, Ser. No. 820,578
Int. Cl. F16d *35/00*
U.S. Cl. 192—58 **12 Claims**



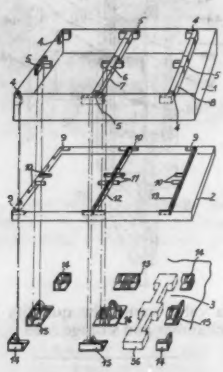
A viscous fluid clutch including relatively rotatable first and second drive members having a fluid shear space therebetween and which are cooperable with a fluid medium in the shear space to provide a shear-type fluid drive therebetween, an annular reservoir for at times storing the fluid medium, a temperature-responsive valve for regulating the flow of the fluid medium from the annular reservoir to the fluid shear space, and a baffle wall cooperating with a front wall of one of the drive members to form a narrow annular cooling passage for the fluid medium and further cooperating with an intermediate wall to form the annular reservoir.

3,559,787

VERTICAL GUIDING DEVICES FOR CONTAINERS IN SHIPS

Rene Charles Caillet, 26 rue de la Republique, 78 Saint-Germain-en-Laye, France

Filed Aug. 8, 1968, Ser. No. 751,098
Claims priority, application France, Aug. 10, 1967, 117506
Int. Cl. B63b 25/00
U.S. Cl. 193—33 8 Claims



Detachable means for guiding standard containers as they are vertically lowered into or hoisted out from the cargo space of a ship, comprising vertical guide means in the form of ropes or chains adapted to be wound up from the upper deck, bearing or anchoring devices disposed at the corners of the cargo space and adapted to be removed by hoisting when these detachable means are not required.

ERRATUM

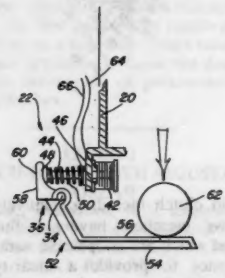
For Class 193—37 see:
Patent No. 3,559,782

3,559,788

SWITCHING ARRANGEMENT AND METHOD EMPLOYING COIN CONTROLLED MOTION TRANSDUCER

Herman G. Jensen, and Leon R. Britton, Chicago, Ill., assignors to The Seeburg Corporation of Delaware, Chicago, Ill., a corporation of Delaware

Filed Mar. 17, 1969, Ser. No. 807,823
Int. Cl. G07f 1/00
U.S. Cl. 194—1 23 Claims



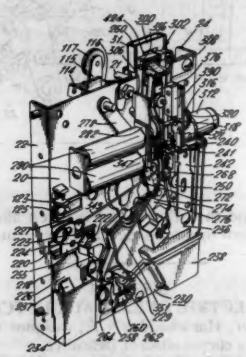
A switching effect is achieved by utilizing a transducer to convert motion of an inanimate object into an electrical signal. Transduction is achieved by having the moving object produce a cyclical flux change in a coil to generate an electrical pulse representative of the desired switching function.

3,559,789

COIN-HANDLING DEVICE

Willard A. Hastie, Aylmer East, Quebec, and Austin Hastie, Ottawa, Ontario, Canada, assignors to Coin Verifiers Company Limited, Ottawa, Ontario, Canada, a company of Ontario

Filed Oct. 4, 1968, Ser. No. 765,145
Claims priority, application Canada, Oct. 4, 1967, 001,673
Int. Cl. G07f 3/02
U.S. Cl. 194—97 41 Claims



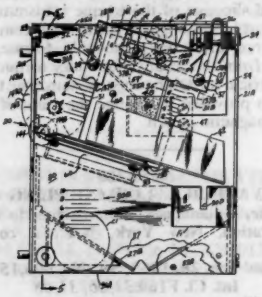
Coin-Handling devices are provided to distinguish genuine coins from spurious coins or slugs. The device includes first means to distinguish between coins and/or slugs formed from a ferromagnetic material from coins and/or slugs formed from a paramagnetic material. Preferably, the first means includes a magnet adapted to be moved into, and out of, face-to-face contact with the coin and/or slug. The device also includes either alone or in conjunction with the first means, second means which distinguishes coins and/or slugs having a smooth peripheral rim from coins and/or slugs having a serrated peripheral rim. Preferably, the second means includes a pair of pivotally mounted hangers having means such as a sharpened edge for engaging the peripheral rim of the coin and/or slug.

3,559,790

COIN REJECTOR MECHANISMS

Harry Greenwald, Whitestone, and Paul Frankenberg, Brooklyn, N.Y., assignors to Greenwald Industries, Inc., Belleville, N.J., a corporation of Delaware. by mesne assignment

Filed Apr. 18, 1968, Ser. No. 722,301
Int. Cl. G07f 3/02
U.S. Cl. 194—99 12 Claims



The disclosure is directed to improvements in a coin rejector of the type disclosed in U.S. Letters Pat. No. 3,289,802 and more specifically to a coin rejector mechanism which

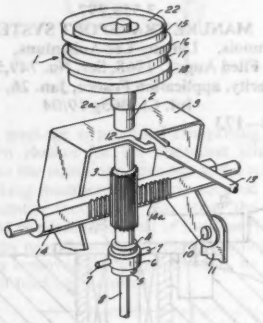
can be accurately and quickly set or adjusted to operate in a positive manner with respect to any size coin and/or coin denomination so that only coins of predetermined materials, thickness and diameter will be accepted thereby, and all other coins rejected; and which rejector is also provided with means for prohibiting an unscrupulous individual from retrieving a coin which has been accepted by the rejector mechanism.

3,559,791

TYPE HEAD ARRANGEMENT

Hermann Waldenburger, Wolkersdorf, Germany, assignor to Triumph Werke Nurenberg A.G., Nurenberg, Germany, by mesne assignments

Filed July 19, 1968, Ser. No. 746,212
Claims priority, application Germany, July 19, 1967, G50672
Int. Cl. B41j *1/32*
U.S. Cl. 197—55 **16 Claims**



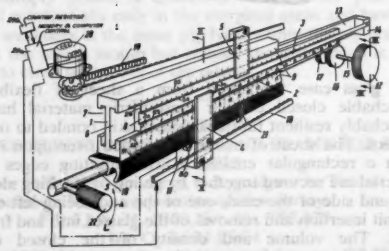
A rotary and axially shiftable type head is composed of a stack of type discs provided with circumferential rows of type faces. A selected type disc having a type face corresponding to a selected character is shifted to an advanced position, while the type discs adjacent thereto are held in a retracted position. When the entire type head is moved toward the platen to a printing position, the type faces of the retracted type discs are at a safe distance from the printing area of the platen so that the rows of type faces can be more closely spaced than in the prior art.

3,559,792

DIGITAL DISPLAY AND CONTROL DEVICE FOR THE SETTING, JUSTIFICATION, AND CONTROL OF LINES OF PRINT

Hans Guldenpfennig, Berlin, Germany, assignor to H. Berthold Messinglinienfabrik Und Schriftgiesserei A. G., Berlin, Germany

Filed May 20, 1968, Ser. No. 730,221
Claims priority, application Germany, July 21, 1967, 1,597
Int. Cl. B41j *29/42, 19/58, 21/04*
U.S. Cl. 197—84 **6 Claims**



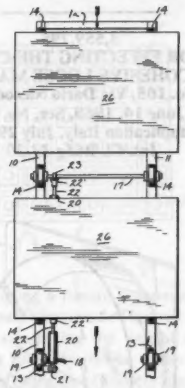
The present invention provides a digital display and control device for the setting, justification, and control of lines of print. The display and control device consists of a guide rail having in the front and rear each a longitudinally extending guide channel mounted on the frame of the composing machine; the device also includes a slide, adapted to slide in the front guide channel, determining the start of the line and having a guide channel therein, a tongue, indicating the line end adapted to slide in the said guide channel in the slide and connected to a rack slidingly mounted in the rear guide channel of the rail, a tabulating device mounted directly under the guide rail, a length indicator, movable along the front side of the rail and overlying the bottom half thereof; the length indicator is mounted on a photoelectric device engaging the tabulating mechanism and controlled thereby, while a justification indicator overlies the top half of the guide rail and is adapted to move along the same.

3,559,793

CONTINUOUS CONVEYOR SYSTEMS

Anthony T. C. Lange, 3810 N 169th St., Brookfield, Wis.

Filed Oct. 11, 1968, Ser. No. 766,791
Int. Cl. B23q *5/22;* **B65g** *13/02*
U.S. Cl. 198—19 **14 Claims**



A continuous conveyor apparatus including a plurality of flat work-holding pallets movably supported on rollers projecting above spaced, parallel tracks, there being adjustable pneumatic pistons adapted to rotatably drive spaced drive rollers to engage the underside of said work-holding pallets and convey the same along said line of rollers, said apparatus including work stations adjacent the conveyor line and associated pallet-transferring means permitting the temporary sidetracking of selected pallets, and said apparatus including novel corner-turning means for automatically transferring pallets onto a transverse conveyor line.

3,559,794

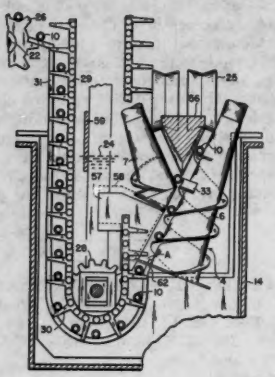
METHOD AND APPARATUS FOR HANDLING ELONGATED WORKPIECES THROUGH A PROCESS AREA

William M. McConnell, Pittsburgh; William H. Bradley, Ben Avon; Howard E. Chappell, Butler; George P. Whitfield, Greentree, and Raymond L. Carey, Pittsburgh, Pa., assignors to Taylor-Wilson Manufacturing Company, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Apr. 23, 1968, Ser. No. 723,411
Int. Cl. B23q *7/00*
U.S. Cl. 198—19 **21 Claims**

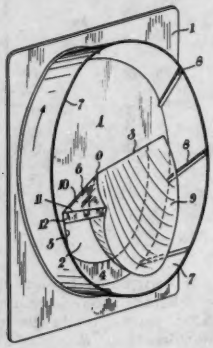
An automatic processing line having a conveyor system continuously feeding workpieces to chain sinkers which

lower the workpiece into a process area at a slope and raise the workpiece from the process area at a slope and a screw



apparatus which removes the workpiece from the chain sinker in the process area and conveys it to a continuous dragout conveyor for removal.

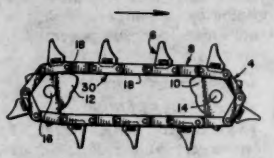
3,559,795
DEVICE FOR EFFECTING THE CHARGING OF NONCOHESIVE LOOSE MATERIAL
Achille Talenti, No. 105, Via Dario Niccodemi, Rome, Italy
Filed June 14, 1968, Ser. No. 737,218
Claims priority, application Italy, July 29, 1967, 38,519/A67
Int. Cl. B65g *33/20*
U.S. Cl. 198—43 **3 Claims**



A device for charging materials in stationary or rotating receptacles or tanks including a vertical panel provided with a charging aperture and applied to a wall of the receptacle, a short cylindrical surface rotatable about a horizontal axis mounted on the panel and surrounding the charging aperture, and a shell-like contoured concave surface fixed to the panel in front of the charging aperture and extending towards the receptacle.

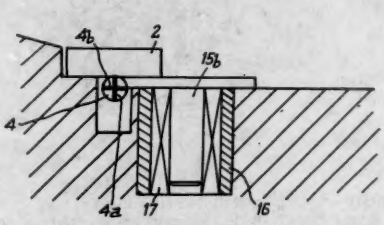
3,559,796
ATTACHMENT FOR LINK CHAINS
Charles F. Marks, Indianapolis, Ind.; Richard F. Werking, Arlington Heights, Ill., and Baird E. Resner, Indianapolis, Ind., assignors to AMSTED Industries Incorporated, Chicago, Ill., a corporation of Delaware
Filed July 31, 1968, Ser. No. 749,060
Int. Cl. B65g *19/22*
U.S. Cl. 198—173 **2 Claims**

A mounting link plate for a link chain has a laterally projecting bridge secured to one of its longitudinal edges. The bridge is press-fit into a slot in a nonmetallic lug. The link and lug are then pivotally secured to a chain by pins and a



pin link plate in a known manner so that the lug is located between the spaced connected link plates and projects away from the chain.

3,559,797
MANURE TRANSPORT SYSTEM
Claude Brunois, Laugny-Les-Aubentons, Aisne, France
Filed Aug. 1, 1968, Ser. No. 749,510
Claims priority, application France, Jan. 26, 1968, 137,500
Int. Cl. B65g *19/04*
U.S. Cl. 198—173 **2 Claims**

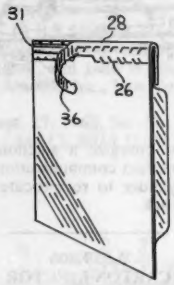


The instant device comprises a manure conveyor of the chain and pusher type wherein the chain rides in a depression of the trough. A rotary guide pulley is used at the turning area wherein the pulley edge lies between the pusher and the conveyor chain.

3,559,798
GLASS CASE
Gerald D. Jacobsen, 1887 Holton Road, Muskegon, Mich.
Filed Sept. 5, 1968, Ser. No. 757,599
Int. Cl. A45c *11/04*
U.S. Cl. 206—5 **3 Claims**

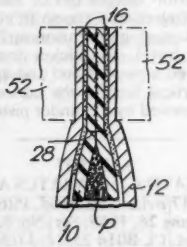
A glass case fabricated from a sheet of flexible and stretchable closed cellular elastomeric material having a stretchably resilient fabriclike outer skin bonded to one side thereof. The sheet of material is folded over upon itself to form a rectangular enclosure. The abutting edges of the material are secured together by gluing or stitching along the end and side of the case, one of the ends being left open to permit insertion and removal of the glasses into and from the case. The volume and density of the closed cellular elastomeric material are such that the case will float in water for an extended period of time despite the presence of a pair of glasses therein.

3,559,799
DISPLAY PACKAGE
Elmer L. Kramer; Donald K. Smith, Cincinnati, Ohio, and Stephen Edelen, Augusta, Mich., assignors to Brown Company, New York, N.Y., a corporation of Delaware
Filed June 12, 1969, Ser. No. 832,624
Int. Cl. B65d *73/00, 75/00*
U.S. Cl. 206—45.34 5 Claims



An improved package is provided comprising a semirigid container, a film closure for the container adapted to be vacuum sealed to the container opening, and a relatively stiff paperboard backing member adhesively secured to the film. The backing member includes a tear strip, the removal of which also served to permit removal of the film from the container and thereby provide access to the container's contents. Once the strip is removed the container may be reclosed by the relatively stiff backing member.

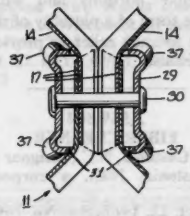
3,559,800
PACKAGING MATERIAL
John Parkman Butler, Appleton, Wis., and Harry Meekma, Peekskill, N.Y., assignors to American Can Company, New York, N.Y., a corporation of New Jersey.
Filed Aug. 13, 1968, Ser. No. 752,264
Int. Cl. B65d *77/38, 85/00*
U.S. Cl. 206—46 6 Claims



A multiply pouch is described wherein the plies are bonded substantially only in the marginal areas and having a line of weakness in the inner ply lying within the ply-bonded area at the pouch mouth but outside the area which is heat sealed to close the mouth of the pouch.

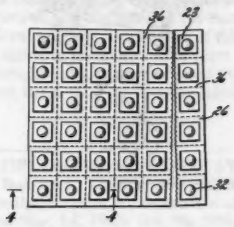
3,559,801
ONE-PIECE REEL ARM AND AN END FRAME FOR PILE FABRIC REEL
Theodore P. Kessler, Rancocas, N.J., assignor to Timron Inc., Moorestown, N.J., a corporation of New Jersey
Filed July 31, 1968, Ser. No. 750,428
Int. Cl. B65d *85/04*
U.S. Cl. 206—51 27 Claims

The reel is formed of one-piece reel arms which are initially flat and which are subsequently bent into triangular configurations. A pair of bent reel arms are secured together at the ends by a clamping means which also forms a socket



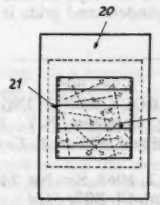
for receiving the spacer bar. The hooks are integral with the reel arm and require no manipulation.

3,559,802
CASTER ASSEMBLY
William Eidus, 254 N. Main St., Spring Valley, N.Y. 10977
Filed May 9, 1969, Ser. No. 823,395
Int. Cl. B60b *33/00*
U.S. Cl. 206—56 10 Claims



A caster for supporting a fixture comprises a block having a socket in which a ball is retained. The ball is adapted to roll in the socket while supporting the weight of the fixture. A common web joins a plurality of like casters in spaced relationship, whereby the plurality of casters may be utilized as a unit in a fixture or the casters may be separated from the web and used singly or in subunits.

3,559,803
PACKAGE FOR NEEDLES, HABERDASHERY OR THE LIKE SMALL ARTICLES
Karl-Heinz Deneke, Auf dem Rott, Gressenich near Aachen, Germany
Filed Feb. 18, 1969, Ser. No. 800,137
Claims priority, application Germany, Feb. 23, 1968, Sept. 21, 1968, P1611973.6-27;MR3009
Int. Cl. B65d *85/24*
U.S. Cl. 206—66 14 Claims



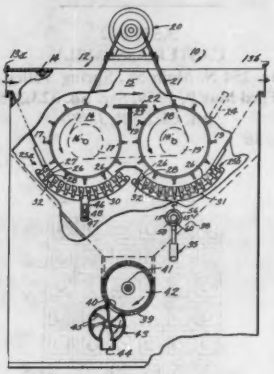
A package for needles formed of a carrier comprising front and rear portions connected along an edge fold line with

apertures and having a shiny metal coating on the interior of one of the shell-like portions and with the shell-like apertures and having a shiny metal coating on the interior of one of the shell-like portions and with the shell-like portions being in the form of a plurality of reflecting surfaces angled with respect to each other to provide optimum light reflecting characteristics.

3,559,804
FIBER CLEANER

Kenneth G. Lytton, Gastonia, N.C., assignor to Fiber Controls Corporation, Gastonia, N.C., a corporation of North Carolina

Filed Oct. 22, 1968, Ser. No. 769,521
Int. Cl. B07b *9/00*
U.S. Cl. 209—3 **10 Claims**



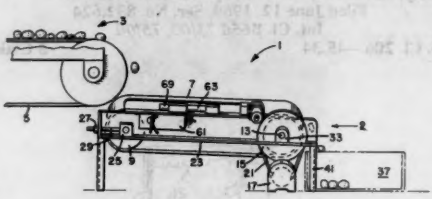
A fiber cleaning machine adapted to be placed in a pneumatic fiber carrying conduit leading to equipment for processing cotton or other fibers. Except for inlet and outlet openings in opposite ends of the machine casing for receiving the fibers to be cleaned and for passing the cleaned fibers from the machine, respectively, the casing is airtight. Between the inlet and outlet openings is a straight channel establishing a path for the air to pass through the machine. Along that path, the air channel has a cross-sectional area at least twice as large as the inlet or outlet opening, thereby decreasing the air velocity in the channel to one-fourth the incoming and outgoing velocities. This establishes a substantially dead air space below the air channel, which is mostly open on its lower side. Below the air channel are two beater-type cleaning cylinders rotatably mounted through the casing of the machine in the dead air space to allow their cleaning operation to be accomplished without being disturbed by the overhead, slowed airflow through the machine. Arcuate grids made up of parallel bars are placed below the lower surfaces of each of the cleaning cylinders. The grid bars constituting each of the grids are simultaneously rotatable to increase or decrease the distance between each of the bars and correspondingly change the upward rake angle of pointed edges extending laterally from the tops of each of the grid bars. Below the cleaning cylinders and grids is an air tight trash removal area.

3,559,805
STONE AND ROCK REMOVING DEVICE

Richard Nelson Cragg, Cohocton, N.Y.; Patricia A. Cragg, Administratrix of said and William E. Cragg, Administrator deceased

Filed July 2, 1968, Ser. No. 742,042
Int. Cl. B07c *5/34*
U.S. Cl. 209—73 **19 Claims**

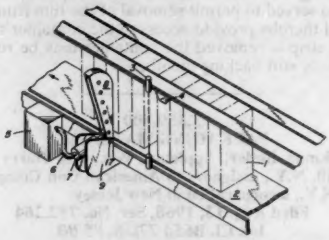
A device for removing stones and rocks intermixed with harvested potatoes comprising a conveyor for receiving and conveying same one by one in contiguous relationship with a sensor transmitting mechanical vibrations whereof those vibrations caused by a stone or rock exceed a predetermined level and whereby such discrete vibrations are converted by a crystal pickup to signal voltages and in conjunction with circuit means therefor energize a solenoid operatively connected to a valve to effect communication from a pneumatic source to an air cylinder to reciprocate a plunger ram to eject such stone or rock.



3,559,806
CARTON EJECTOR

Lyndon Gene Bevins, Houston, Tex., assignor to General Foods Corporation, White Plains, N.Y., a corporation of Delaware

Filed Apr. 21, 1969, Ser. No. 818,003
Int. Cl. B07c *9/00*
U.S. Cl. 209—74 **6 Claims**

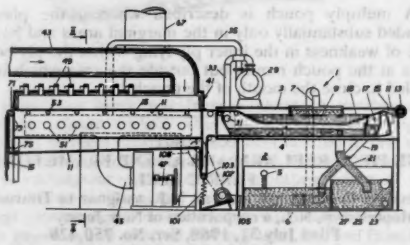


An improved carton ejector device has been discovered which is capable of ejecting a carton in about 20 to 50 milliseconds without damaging the carton surface of interrupting the regular carton travel. The kicker-arm is designed such that it rotates around a pivoted end and applies a horizontal force against a vertical face of the carton while it rotates. The kicker-arm is moved by a cylinder piston.

3,559,807
SEWAGE TREATING APPARATUS AND METHOD

Bertram B. Reilly, 17 Briar Cliff Road, Pittsburgh, Pa. 15202

Filed June 26, 1969, Ser. No. 836,738
Int. Cl. B01d *25/34, 33/36*
U.S. Cl. 210—68 **10 Claims**



A method and apparatus for separating and drying sewage sludge by filtering an aqueous slurry of sludge through a filter

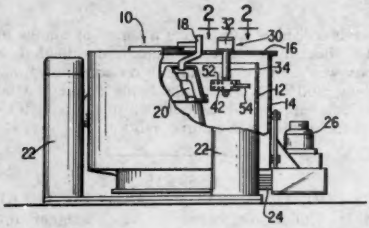
medium on a travelling foraminous conveyor to deposite a layer of sludge on the filter medium and passing the conveyor and filter medium with a sludge deposit through a drying chamber where the sludge is dried by downdraft flow of hot gases and the filter medium and sludge deposit subsequently removed from the conveyor and the conveyor returned for application of fresh filter medium and recycle. Preferably the filter medium and sludge are removed from the conveyor by passage through a furnace where they are burned and the resulting hot combustion gases fed to the drying chamber.

3,559,808

LOAD INDICATOR FOR CENTRIFUGAL SEPARATOR

Frank O'Conor, Moline, and John W. Sherlock, East Moline, Ill., assignors to Ametek, Inc., New York, N.Y., a corporation of Delaware

Filed Sept. 27, 1968, Ser. No. 763,270
Int. Cl. B01d *35/00*
U.S. Cl. 210—86 **11 Claims**



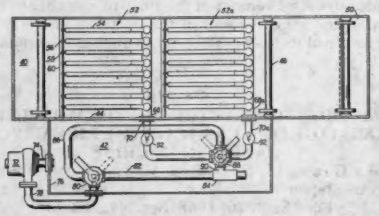
A load indicator for centrifugal separators which comprises a rotatable shaft extending into the basket of a separator and provided with an adjustable feeler for rotation with the shaft to stop feeding when the layer of solids or the layer of liquid around the wall of the basket reaches a predetermined thickness. A cam and overcenter spring mechanism at the upper end of the shaft provides for holding the feeler in either a set or triggered position, and a hydraulic cylinder provides for resetting the feeler.

3,559,809

FILTER BACKWASH MEANS

Stephen Barrett Barmore, Southington, Conn., assignor to AMF Incorporated, a corporation of New Jersey

Filed Feb. 7, 1969, Ser. No. 797,428
Int. Cl. B01d *35/22*
U.S. Cl. 210—333 **12 Claims**



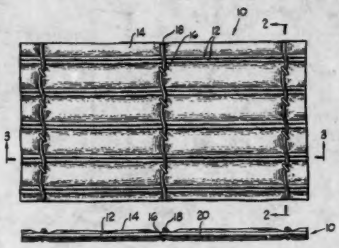
A Filtering System which is capable of handling large quantities of coolants and the System includes a reservoir for filtrates as, for example, from metal-working machines. The filtrate is returned to such machines by a pump which draws some of it from the reservoir, passes it through an eductor and then returns it to the reservoir. In operation, suction is applied to the outlet side of the filters to cause flow through them. In addition, valve means are provided so that the pump discharge can be used to clean the filters.

3,559,810

FABRIC INCLUDING A FILLER OF GREATER AREA THAN THE FABRIC

Charles A. Lee, and Warren E. Furbeck, Knoxville, Tenn., assignors to Appleton Wire Works Corporation, Appleton, Wis., a corporation of Wisconsin. by mesne assignments

Filed Apr. 29, 1966, Ser. No. 546,460
Int. Cl. B01d *39/08*; **D05c** *17/00*
U.S. Cl. 210—493 **9 Claims**



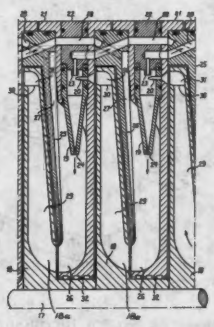
A sewn fabric is formed by sewing nonwoven filler to a plurality of rack filament using cross filaments transversely of the rack filaments to sew the filler to the rack filaments. The filler is in the form of a stabilized sheet of filler filaments and in the finished fabric is undulated in at least one direction to give it a substantially greater surface area than the projected area of the fabric itself, thus making the fabric puckered.

3,559,811

MULTIPLE HYDROCYCLONE SYSTEM

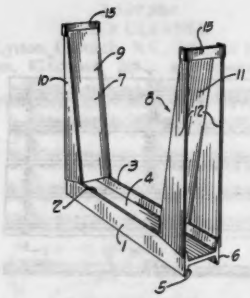
Bengt Ingmar Dahlberg, Tumba, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden, a corporation of Sweden

Filed Nov. 14, 1969, Ser. No. 876,803
Claims priority, application Sweden, Nov. 15, 1968, 15514/68
Int. Cl. B04c *5/28*
U.S. Cl. 210—512 **3 Claims**



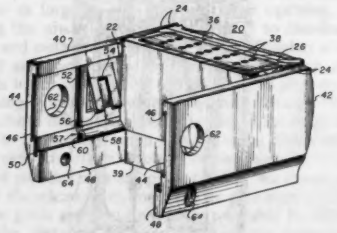
A centrifugal pump has a housing containing a plurality of pump rotors spaced along a common rotation axis and also containing layers of cyclones in the spaces between adjacent rotors, the cyclones of each layer being disposed radially in a circle or ring concentric to the rotation axis and with their narrow ends directed toward this axis and provided with an outlet, each cyclone having an inlet at its wide end portion. The cyclones of one layer have their inlets connected to the pressure side of a pump rotor and have their outlets connected to the suction side of a pump rotor, whereby the cyclone layers are connected in series so as to effect progressive concentration of a sludge contained in a suspension.

3,559,812
STORAGE RACK CONSTRUCTION
Theodore L. Wolf, Eastlake; Louis Radakovich, Chesterland, and Frank B. Robb, Timberlake, Ohio, assignors to Jos. Dyson & Sons, Inc., Eastlake, Ohio, a corporation of Ohio
Filed Feb. 12, 1969, Ser. No. 798,725
Int. Cl. A47f 7/00
U.S. Cl. 211—60 8 Claims



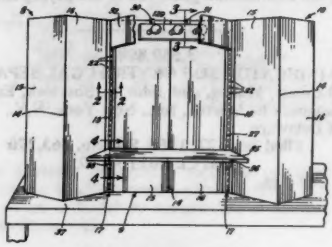
The disclosure hereof comprises a rack unit which is availed of in a plurality thereof and adapted to be stacked one above the other or superimposed so as to provide for a storage of pipe bars or other elongated members when the racks are used in pairs and superimposed in pairs a basic feature being directed toward added strength and simplicity of construction. By formation of the rack units of the disclosure, the same are intended to be superimposed one upon the other and when pairs of superimposed racks are used, the strength and weight distribution is such that vastly greater loads are supportable with an increased safety factor and facility of manufacture not heretofore available.

3,559,813
MODULE MOUNTING SYSTEM
Charles William Sosinski, Linden, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J., a corporation of New Jersey
Filed Aug. 2, 1968, Ser. No. 749,883
Int. Cl. A47f 5/00, 5/08
U.S. Cl. 211—89 19 Claims



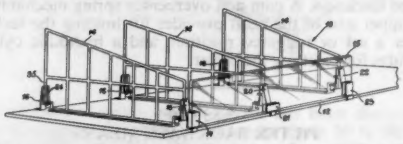
A modular mounting system for mounting feed-through modules. A feed-through module is one in which components, or conductors, may be introduced to the module from both its front and back surfaces. The module mounting system comprises first and second side rails held together and supported by means of end blocks to which the first and second side rails are assembled. Provision is made for mounting holes in both the end blocks and side rails to permit fastening devices to be passed therethrough to mount the assembly to a mounting surface. Placed within the side rails are flexure means which engage in locking relationship steps on the module walls thus retaining the module within the mounting system. The flexure members side rails and end blocks may take on a number of different configurations in accordance with the module configuration, and the manner of mounting.

3,559,814
FOLDING TABLE-TOP DISPLAY
John G. Downing, Cincinnati, Ohio (c/o Dawning Displays, 300 Gennessee St.)
Filed Feb. 3, 1969, Ser. No. 796,098
Int. Cl. A47f 5/10
U.S. Cl. 211—135 2 Claims



A portable display comprising a series of blanks made of laminated sheet material, each blank being divided centrally by a body weakening crease line into two panels foldable on themselves, and adjacent blanks being connected by hinge means which support substantially all of the weight of shelving when the display is in setup condition.

3,559,815
STORE COUNTER PARTITION AND CLIP THEREFOR
Charles P. Huddleston, Tenafly, N.J., assignor to Selfsel Equipment Corporation, Hackensack, N.J., a corporation of New Jersey
Filed July 1, 1969, Ser. No. 838,098
Int. Cl. A47f 5/00
U.S. Cl. 211—184 9 Claims

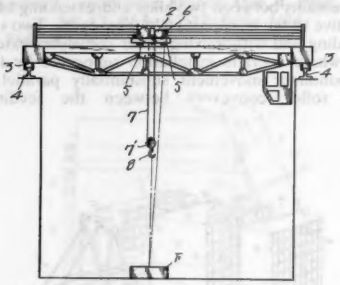


A store counter partition for dividing a countertop into a plurality of bins having a pair of tabs extending inwardly in the longitudinal direction on each end of the partition. The tabs are offset from each other vertically and are spaced to preclude lateral movement of the tines of a resilient, removable clip which grips the end of the partition and is provided with a recess at its lower extremity to engage the countertop.

3,559,816
METHOD FOR POSITIONING THE WHEELED CARRIAGE OF A CRANE OR THE LIKE CARGO HANDLING MACHINE
Kiyotaka Hirata, 15, 5, 2-chome Hanazono-cho, Takamatsu, Kagawa, Japan
Filed Sept. 26, 1968, Ser. No. 762,732
Claims priority, application Japan, Sept. 30, 1967, 42/83,327
Int. Cl. B66c 17/00; F21v 29/00
U.S. Cl. 212—21 4 Claims

A method for positioning the wheeled carriage of a crane or the like cargo-handling machine in which a spotlight device is mounted on said carriage and the carriage is positioned so that the focus of a ray of light from said spotlight device may be positioned right below the carriage. A mechanism for positioning the wheeled carriage of a crane or the like cargo-handling machine comprising a spotlight device mounted on said carriage and supporting an electric

lamp having bases at the ends therein, said spotlight device being provided with cooling air passages which are effective

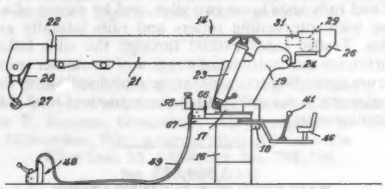


to cool the bases thereby to positively cool the bases while cooling the lamp body itself to a lesser degree.

3,559,817
REMOTE CONTROL SYSTEM FOR HYDRAULIC CRANES

Wilburn Kelly Brown, Morton Grove, Ill., assignor to Circle Tool & Mfg. Co., Des Plaines, Ill., a corporation of Illinois

Filed Dec. 1, 1967, Ser. No. 687,374
Int. Cl. B66c *23/54*
U.S. Cl. 212—35 **4 Claims**



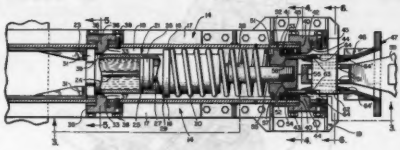
A hydraulic crane, especially when used for loading ships or for other uses where a fixed crane operator could not see the load being picked up or deposited, is controlled with finesse by an operator connected to the control center by a light hydraulic cable. The operator carries a chest unit with the necessary levers, each operating a piston in a master cylinder. The master cylinder is connected through slim lines in the cable to a slave cylinder of identical nature except that its piston-coupled lever is not a handle but operates a main hydraulic control valve at the crane control center. Thus the operator's hand movement, however gradual, is exactly reflected by movement of the spool of the control valve. The ports on opposite sides of the piston of the master cylinder are connected to the two ports on the opposite sides of the slave cylinder to form, in effect, a closed circuit. A reservoir for each such circuit has a screwed-in piston to maintain a static pressure substantially eliminating hydraulic backlash. It may be used in initially filling the lines to exclusion of all air.

3,559,818
HYDRAULIC DRAFT GEAR

William H. Knippel, Palo Park, Ill., and Marvin Stark, Michigan City, Ind., assignors to Pullman, Incorporated,, Chicago, Ill., a corporation of Delaware

Filed Feb. 14, 1969, Ser. No. 799,176
Int. Cl. B61g *9/02, 9/12*
U.S. Cl. 213—8 **10 Claims**

A hydraulic cushioning device and draft gear is disposed in cushion pockets at opposite ends of a center sill. The cushioning device comprises a hydraulic cylinder with a piston assembly slidable lengthwise therein. The cylinder is anchored within the center sill by removable stops which extend through the center sill. The piston assembly includes a piston rod which projects through an end wall of a yoke housing and is retained therein by means of a connecting element seated in a socket. The yoke housing is provided with outward projections forming, with a pair of removable stops projecting through the center sill, a pair of spring pockets

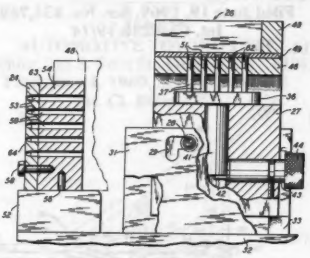


which contain springs adapted to return the piston assembly to a neutral position during draft impacts. The yoke housing includes a coupler shank which is movable within the yoke housing to transmit buff impacts directly to the connecting element of the piston rod.

3,559,819
METHOD AND APPARATUS FOR ORIENTING ARTICLES WITH TAPERED ENDS

Donald M. Large, Temple, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y., a corporation of New York

Filed May 7, 1969, Ser. No. 822,489
Int. Cl. B65g *69/00*
U.S. Cl. 214—1 **14 Claims**



Small studs having tapered first end portions and opposed flat end surfaces are vertically oriented with the tapered portions up. This is accomplished by shaker loading the pins into bores formed in a plate bottomed with movable pins having grooved end surfaces. The studs are then elevated by the pins to free them of the bores and eliminate the lateral support provided by the bores. The tapered portions of the studs are unstably supported on the pins and the flat surfaces of the studs are stably supported on the pins so that when the pins are moved to lift the studs free of the bores the studs with the flat surfaces down are retained on the pins and those with the tapered portions down fall from the pins.

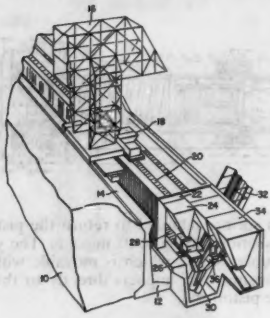
3,559,820
SYSTEM FOR AUTOMATING BLAST FURNACE SCALE CAR

William A. Munson, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed May 7, 1969, Ser. No. 822,491
Int. Cl. B65g *3/20, 67/06*
U.S. Cl. 214—41 **13 Claims**

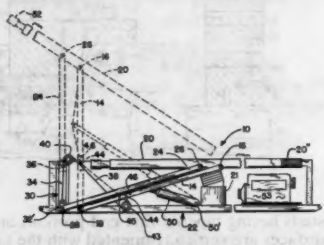
Described is a system for automating scale cars of the type used to receive materials from storage hoppers, weigh those materials, and charge them into blast furnace skip cars. The system is characterized in having means for comparing electrical signals indicative of the actual position of the scale car, and the actual weight of materials charged into the scale car, with signals proportional to the desired car position and desired weight of materials to be charged. In this manner, the

comparing means is effective to automatically stop the scale car at the correct bin position, open the discharge chute of the bin above the scale car until the desired weight is reached, and then move the scale car to a position beneath



another bin or to a discharge position, all of this being determined by indicia on a punch card, computer program or the like which produces the aforesaid signals proportional to desired car position and weight.

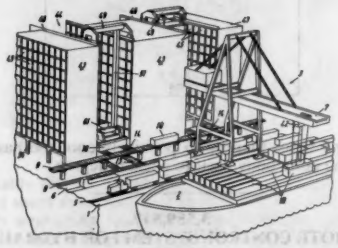
3,559,821
DRILL PIPE HANDLING APPARATUS
Ralph Edward James, Odessa, Tex. (604 N. 10th St., Broken Arrow, Okla. 74012)
Filed June 19, 1969, Ser. No. 834,769
Int. Cl. E21b *19/14*
U.S. Cl. 214—1p **9 Claims**



Apparatus for handling tubular goods, including drill pipe, which are transferred between pipe racks located near ground level to an inclined position overlying the substructure of a drilling rig where the pipe is picked up and lowered into a borehole, or alternatively, for handling tubular goods which are removed from the borehole and returned to the pipe racks. The apparatus includes a pipe receiving trough which is elevated from a lower substantially horizontal position to an elevated substantially inclined position by means of spaced-apart powered and slave booms. The pivotal action of the powered boom causes the slave boom to be extended upwardly as it pivots toward the vertical position.

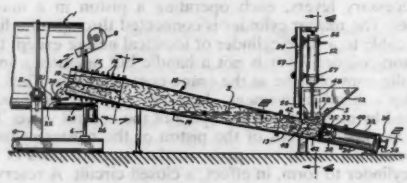
3,559,822
CONTAINER TRANSLOADING INSTALLATION
Uwe Lichtenford, and Klaus Walkhoff, Essen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Feb. 20, 1969, Ser. No. 800,967
Claims priority, application Germany, Feb. 22, 1968, 1,556,636
Int. Cl. B65g *63/00*
U.S. Cl. 214—14 **11 Claims**

One system provides container storage space over which a travelling crane moves a spreader on a vertically guided boom. The containers can be quickly raised and lowered by remote control and a track of the travelling crane extends both over the storage space and over railway tracks and vehicle roads with respect to container transport dock area. Further system provision is made having silo storage compartments extending parallel to transport roller conveyors. An aisle remains between two silos and extending at a right angle relative to the transport roller conveyors. Two superimposed feeding and withdrawing roller conveyors extend into the aisle where a crane installation supported by the silos permits container movement substantially parallel to the transport roller conveyors between the feeding and



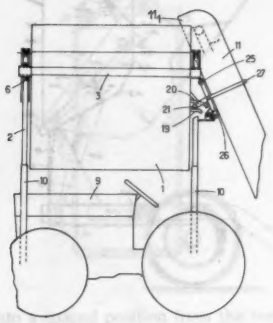
withdrawing roller conveyors on the one hand and the compartments on the other hand. A carriage of the crane installation carries a spreader guided by two vertical beams of a frame which by means of an upper traverse with intervening rollers and rails rests upon two silos, and by means of a lower traverse with intervening rollers and rails laterally engages the silos. Traffic lanes extend through the silos below the compartments and automated control of container transloading occurs according to date storage and distribution for container placement according to metacentric and load stabilization requirements.

3,559,823
RAM FEED FOR INCINERATORS
Albert Ostrin, 4516 Highway 7, Minneapolis, Minn. 55416
Filed Mar. 14, 1969, Ser. No. 807,294
Int. Cl. F23k *3/00*
U.S. Cl. 214—23 **6 Claims**



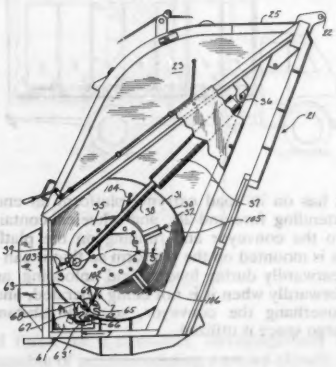
Hydraulic ram apparatus for conveying a mixture of liquid and solid scrap material from a supply hopper through a conduit to an incinerator wherein a shearing head on a feed ram cooperates with a shearing edge on the outlet of the supply hopper to cut up large pieces of solid scrap material as the feed ram reciprocates longitudinally within the supply conduit past the supply hopper outlet. A vertically reciprocal packing piston forces the scrap material out of the supply hopper into the supply conduit in synchronization with the reciprocal movement of the feed ram; and scrap material is tightly compacted by the feed ram within straight, tubular, compacting sections at the inlet and discharge ends of the expanding supply conduit to seal the supply conduit against the rearward movement of combustible gases between the incinerator and supply hopper.

3,559,824
STOCKING HOPPER FOR A TRACTOR
Gabriel Joseph Benac, and Rene Louis Bernard Benac, Berdoues, Gers, France
Filed Nov. 29, 1968, Ser. No. 780,048
Claims priority, application France, Mar. 4, 1968, 142,305
Int. Cl. B65g 67/22; B60p 1/04
U.S. Cl. 214—42 1 Claim



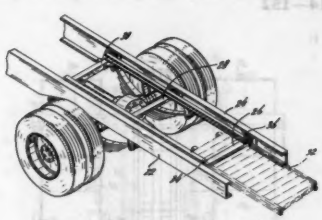
The invention relates to a stocking hopper, in particular for a tractor, including a chassis support bearing the hopper, said hopper being allowed to revolve on the chassis along an axis located close to one of the side edges of the hopper and close to the loading door of the hopper, which allows the tilting of the hopper at a sufficiently high level, though the hopper is not at a high level in loading position.

3,559,825
REFUSE BODY LOADING MECHANISM
Arnold F. Meyer, Pewaukee; John E. Wieschel, Hartland, and Leslie F. Hansen, Greendale, Wis., assignors to The Heil Co., Milwaukee, Wis., a corporation of Wisconsin
Filed Dec. 31, 1968, Ser. No. 788,196
Int. Cl. B65f 3/00
U.S. Cl. 214—83.3 7 Claims



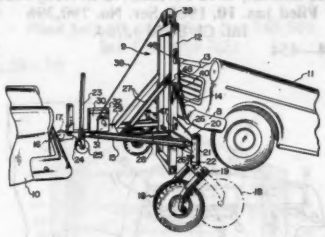
The loading mechanism includes a packer blade having a serrated lower edge and having pivotal connections at the lower portions of its sides with hydraulic ram driven discs mounted for rotation in opposite sidewalls of the body. The upper end of the packer blade is pivotally suspended from the forward portions of pivoted brackets, the rear portions of said brackets being pivoted to the sidewalls of the body for oscillating movement and being powered by hydraulic rams during certain parts of the cycle. The packer plate has a curved cross-sectional shape to coact with the lower edge of a stationary baffle in preventing spillover of material. There is a star wheel control for the hydraulic rams.

3,559,826
AUTOMOTIVE CHASSIS
John C. Abromavage, Tempe, and Henry S. Shattles, Phoenix, Ariz., assignors to Arcoa, Incorporated, Phoenix, Ariz., a corporation of Oregon
Filed June 27, 1969, Ser. No. 837,246
Int. Cl. B65g 69/28
U.S. Cl. 214—85 8 Claims



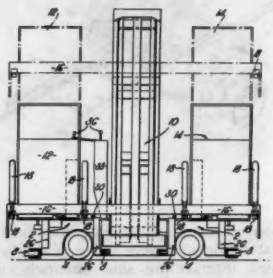
An automotive chassis of the type including a pair of longitudinally extending channels and a plurality of transverse cross members intersecting said channels, the transverse members being of a reduced cross section so as to define a longitudinally extending storage space intermediate the tops of the transverse cross members and the tops of the pair of channels, particularly such a construction used to support a longitudinally extending ramp slidable from the rear end of the chassis to facilitate loading of the truck.

3,559,827
AUTOMOTIVE TOWING UNIT
Francis E. Schier, 715 S. First St., Oregon, Ill. 61061
Filed June 4, 1969, Ser. No. 830,243
Int. Cl. B60p 3/12
U.S. Cl. 214—86 14 Claims



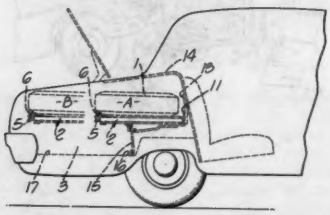
This towing unit is a self-contained independent unit having its own battery and reversible electric motor operated hoist controlled by the operator with a two-battery switch block connected with the battery and motor through a long enough flexible cable to enable the operator to stand as close to or far from the work as he prefers or considers best. The tow frame, which is carried on two caster wheels that are spaced farther apart than the front wheels of a car and are detachable lockable in a fixed parallel relationship for steering is connectable to a tow car or truck with a conventional trailer hitch, and when uncoupled has its front end supported on a wheeled trailer jack. The frame has a upright generally rectangular frame or rack on its rear end onto which the end of a car to be towed is hoisted by pulley and cable means connected with a cable windlass driven in either direction by the electric motor through reduction gearing, the hoisted car being attached by chains to the rack at a selected elevation to transfer the weight to the chains and use the latter for towing. The caster wheels are carried in spring forks to cushion the load in transit.

3,559,828
METHOD OF REMOVING STACK FROM A WAREHOUSE WITH A LIFT TRUCK
John Gordon Roper Tyndall, Wycombe; Julius Kingsley Campbell Lawrence, Crowle, and Ronald Stephen Daya, Surrey, England, assignors to Miles Druce & Company Limited, High Wycombe, England, a British company
Original application Feb. 7, 1967, Ser. No. 666,159, now Patent No. 3,495,725, dated Feb. 17, 1970. Divided and this application Sept. 30, 1969, Ser. No. 871,059
Int. Cl. B65g *1/06*
U.S. Cl. 214—152 **1 Claim**



A method of removing desired items of stock from a warehouse utilizing a forklift truck having a mast and having a framework movable up and down the mast, with the forks extending laterally out from the framework, also having an operator's platform carried by the framework on the same side of the mast as the forks, and the forks being movable vertically relatively to the operator's platform, and the forks, platforms and the mast of the truck being movable across the width of the truck, and the truck having stock holding means extending out from its side.

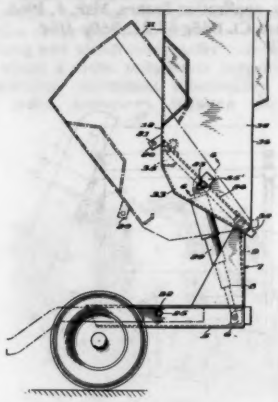
3,559,829
SPARE TIRE HOLDER
John Wallace Shamel, 4642 Fornan, North Hollywood, Calif.
Filed Jan. 10, 1969, Ser. No. 790,396
Int. Cl. B62d *43/04*
U.S. Cl. 214—454 **3 Claims**



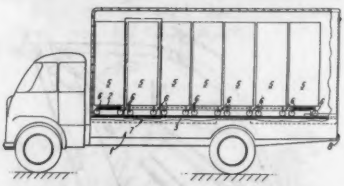
A spare tire holder which places the tire above the cargo space in the trunk of a vehicle wherein the tire rests and is affixed to a slidable tray so that when it is necessary to retrieve the spare tire the tray may be released and pulled rearwardly over any cargo in the trunk to a convenient position for removal of the spare tire.

3,559,830
COLLECTION UNITS
Charles R. Toppins, Knoxville, Tenn., assignor to Dempster Brothers, Inc., Knoxville, Tenn., a corporation of Tennessee
Filed Jan. 3, 1969, Ser. No. 788,852
Int. Cl. B60p *1/28*
U.S. Cl. 214—508 **10 Claims**

A residential collection and compaction unit mounted on a vehicle to be mobile and comprising a receptacle into which refuse can be dumped as collected from house-to-house or other points of accumulation and to be moved to a collection vehicle, such as a packer body. The receptacle of the collection unit is provided with means for compacting the refuse therein and utilizes the same power device both for compacting and for dumping the body. The body may be provided, if desired, with a sump for collecting liquids.



3,559,831
GOODS VEHICLES
William A. Weston, Lanarkshire, Dunalastair, Crawford, Scotland
Filed Apr. 29, 1968, Ser. No. 725,064
Claims priority, application Great Britain, Apr. 27, 1967, May 26, 1967, Nov. 3, 1967, Mar. 27, 1968, 19,366/67;24,498/67;50,061/67;14,831/68
Int. Cl. B60p *1/44*
U.S. Cl. 214—518 **17 Claims**

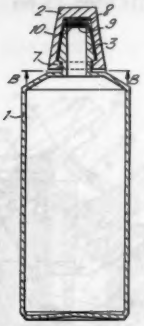


A van has on its load carrying platform an endless conveyor extending fore-and-aft, and wheeled containers connected to the conveyor and running on the platform. The conveyor is mounted on the platform so that it can be moved bodily rearwardly during loading and unloading, and can be moved forwardly when it is not being operated, and the containers overhang the conveyor, so that substantially the whole cargo space is utilized.

3,559,832
CONTAINER PROVIDED WITH A SAFETY HERMETIC SEAL CAP
Vincenzo Balducci, Via Foggia 18, Andria, Bari, Italy
Filed Jan. 17, 1969, Ser. No. 792,018
Claims priority, application Italy, Jan. 18, 1968, 34,260/68
Int. Cl. A61j *1/00;* **B65d** *55/02*
U.S. Cl. 215—9 **2 Claims**

A safety closure for a container, which also provides a hermetic seal, is formed by a cap which fits downwardly over the neck portion of the container. The neck has a horizontally arranged annular groove formed at its lower end and at least one vertical groove extends downwardly on the outer surface

of the neck to the horizontal groove. The cap member is provided with a spring and sealing means on its inner surface and it also contains a tooth or projection which fits into the vertical groove of the neck as the cap is placed on the container and passes downwardly to the horizontal groove where



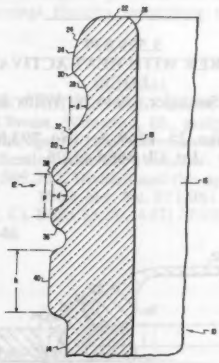
it is rotated into a spaced position from the vertical groove and fits within a notch for locking the cap onto the neck of the container. In the locked position the spring and sealing means within the cap are biased against the opening in the upper end of the neck for providing the hermetic seal.

3,559,833

CONTAINER FINISH CAPABLE OF ACCOMMODATING A VARIETY OF DIFFERENT CLOSURES

Arthur H. Alonso, Island Park, N.Y., assignor to Pepsico, Inc., New York, N.Y., a corporation of Delaware

Filed Nov. 29, 1968, Ser. No. 779,689
Int. Cl. B65d *1/02*
U.S. Cl. 215—31 **7 Claims**



A novel finish for a container, advantageously a bottle, which is capable of accommodating a crown closure or of accommodating a roll-on closure or of accommodating a threaded resealer cap.

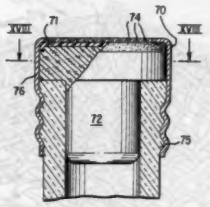
3,559,834

CLOSURE FOR AGING STILL WINE IN BOTTLE

Walter S. Taylor, Bully Hill R.D. 2, Hammondsport, N.Y.

Continuation-in-part of application Ser. No. 709,990, Mar. 4, 1968, now abandoned. This application June 18, 1969, Ser. No. 834,480
Int. Cl. C12g *1/00*; **C12h** *1/00*; **B65d** *39/00*
U.S. Cl. 215—48 **14 Claims**

A closure for a bottle containing still wine, comprising a plastic cap having a central opening which exposes the upper portion of a cork rigidly secured to the cap; the cork permitting the still wine in the bottle to breathe sufficiently for aging of the particular wine. The configuration of the opening functions as a guide for a corkscrew. The cap has an inner ring which is resiliently expansible for snugly receiving the cork which is also secured to the cap by adhesive means, an outer ring in the cap secured concentrically to the inner ring for bearing against the lip of the wine bottle. The inner ring may be provided with dimples or flanges to augment the securing relationship of the cap to the cork. The central opening may be large enough to receive and guide the cork-



screw as a whole, or one or several smaller openings may be provided to receive and guide the spiral-shaped shaft of the corkscrew.

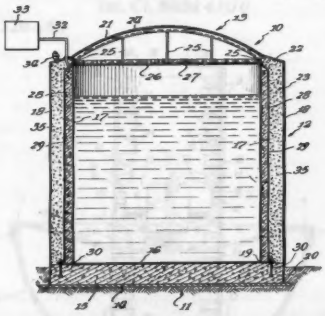
A cap threaded on the neck of the bottle, the cap having a cork secured to its underside and being provided on its top with an opening or plurality of openings so that the cork can breathe, the cork being in a state of compression and of a thickness adapted for aging the particular wine in the bottle. An optional plastic insert between the cap and cork retards the diffusion of atmospheric gases into and out of the wine bottle.

3,559,835

INSULATED STORAGE TANK WITH INSULATION RESTRAINED AGAINST SETTLING BECAUSE OF METAL CONTRACTION

Kenneth Wilson Lange, Hinsdale, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill., a corporation of Illinois

Filed July 17, 1968, Ser. No. 745,501
Int. Cl. B65d *7/22*
U.S. Cl. 220—10 **11 Claims**



Disclosed is an improved insulated tank having a part thereof which is double walled. The double-walled portion, which may be cylindrical, spherical or some other shape, contains free-flowing insulating material and a resilient insulating blanket which has been compressed by active pressure substantially above the lateral passive pressure caused by the free-flowing, usually granular, insulation. When the inner wall of the tank contracts during low-temperature use, such as in the storage of a cryogenic liquid, the blanket expands sufficiently far and with enough pressure to occupy the increased insulating space without settling of the free-flowing insulation.

3,559,836

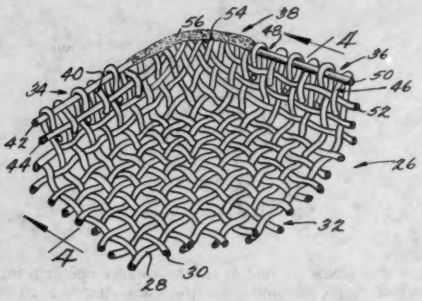
WIRE CLOTH TRAY

Harold E. Pink, and Ronald G. Daringer, Cambridge, Md., assignors to Cambridge Wire Cloth Company, Cambridge, Md., a corporation of Maryland

Continuation of application Ser. No. 705,163, Feb. 13, 1968, now abandoned. This application Sept. 17, 1969, Ser. No. 863,670

Int. Cl. B65d 7/20; F27b 21/04

U.S. Cl. 220—19 24 Claims



A wire cloth tray in which the interwoven longitudinal and transverse wires are gathered at each corner to form a rounded corner, the sidewalls and endwalls being bent over at their upper extents to define their top edges and each rounded corner being severed across its upper extent and the severed edges being welded throughout its length to connect all of the severed wires of each corner. The invention also relates to a reinforcing bar which extends parallel and adjacent to the sidewalls, extends through each corner, and has a short portion at each end lying parallel to the endwalls.

3,559,837

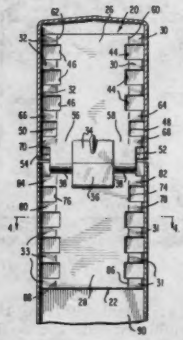
HINGE STRUCTURE FOR CIGARETTE LIGHTERS

Frederick J. Ransom, Atlanta, and James R. Daniel, Stockbridge, Ga., assignors to Scripto, Inc., Atlanta, Ga.

Filed Jan. 22, 1969, Ser. No. 793,001

Int. Cl. B65d 43/16; E05d 5/02

U.S. Cl. 220—32 2 Claims



The hinge leafs of the hinge structure joining the cover and body of a decorative case for cigarette lighters are provided with tongues or barbs which bite into the sidewalls of the case and anchor the hinge in place. In this way, fastening techniques which mar or otherwise detract from the appearance of the case are avoided.

3,559,838

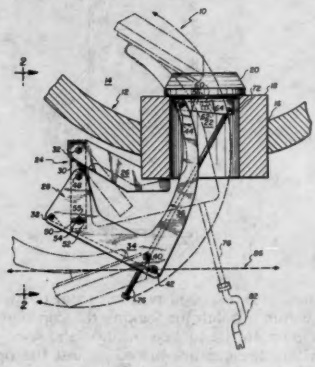
MANWAY REMOVAL APPARATUS

William James Bow, Morristown, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J., a corporation of New York

Filed Aug. 15, 1968, Ser. No. 752,942

Int. Cl. B65d 43/18

U.S. Cl. 220—34 6 Claims



A manway closure removal apparatus for use with an enclosed housing having an elliptical manway opening which is smaller in area than an elliptical manway closure which is mounted in the housing. The apparatus includes a linkage which is operatively connected to the manway closure for movement of the manway closure into a position within the cylinder which is spaced-apart from the manway opening, and after rotating the closure substantially 90°, it is possible to pivot the manway closure through the manway opening into an exterior position with respect to the housing.

3,559,839

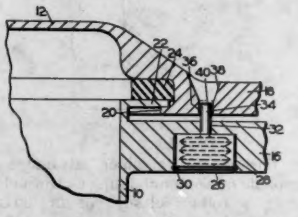
PRESSURE COOKER WITH HEAT ACTIVATED SAFETY LOCK

Raymond Joseph Seethaler, 2044 N. Willis Blvd., Portland, Oreg. 97217

Filed Jan. 24, 1969, Ser. No. 793,858

Int. Cl. B65d 41/06

U.S. Cl. 220—40 7 Claims



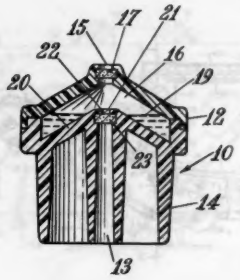
A safety lock wherein the handles of a pressure cooker of the type having a turn off lid are locked together as long as the temperature of the pressure cooker is above a selected minimum to prevent premature opening of the cooker. One of the handles has a heat expandable element provided with a lock pin capable of engaging a latch opening in the other handle under raised temperatures for locking the handles against rotation. The lock pin has a colored end portion by means of which the position of the lock pin is easily visible.

3,559,840

VENTING CLOSURE FOR LIQUID CONTAINERS

Richard M. Wilson, Fairview Park; Helmut K. Amthor, Rockly River, and Godfrey H. Klun, Parma, Ohio, assignors to Union Carbide Corporation, New York, N.Y., a corporation of New York

Filed Dec. 27, 1968, Ser. No. 787,362
Int. Cl. B65d 51/16
U.S. Cl. 220—44 7 Claims



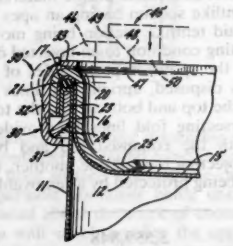
A venting closure for a liquid container, e.g. a battery vent plug, which is sensitive to tilting of the container such that the vent closes off whenever the container tilts and opens when the same resumes its original position. The closure consists of a chamber containing a partial filling of mercury. The chamber has an upwardly sloping bottom surface having a small opening in the upper portion thereof communicating with a vent passage. The top of the chamber also has a vent opening for permitting gases to escape from the chamber. Each opening is small enough to prevent the liquid mercury from flowing through it but large enough to vent gases therethrough. In operation, when the container tilts, the mercury flows over and closes off the openings thereby preventing fluid from leaking from the container. When the container resumes its original position the mercury flows away from the openings thereby permitting the vents to again open.

3,559,841

RECONDITIONABLE CONTAINER

Frederick E. Ullman, Winnetka, Ill., assignor to Inland Steel Company, Chicago, Ill., a corporation of Delaware

Original application June 28, 1966, Ser. No. 649,714, now Patent No. 3,505,722. Divided and this application July 24, 1969, Ser. No. 871,061
Int. Cl. B65d 53/00; A47j 27/08, 36/10
U.S. Cl. 220—46 17 Claims



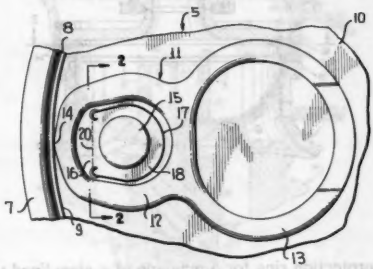
An improved multitrip metallic shipping container which permits of repetitive use of the metallic container components while at the same time permitting unimpeded access into the interior of the container and into the normally inaccessible chime portions thereof for cleaning, dedenting and related container reconditioning purposes.

3,559,842

PULL TAB WITH HINGED CONNECTING PORTION

Charles E. Rich, Palos Heights, Ill., assignor to Continental Can Company, Inc., New York, N.Y., a corporation of New York

Filed Jan. 10, 1969, Ser. No. 790,266
Int. Cl. B65d 17/24
U.S. Cl. 220—54 9 Claims



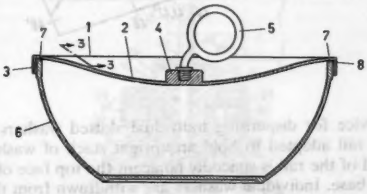
This disclosure relates to a pull tab of the type having a forward body portion and a rear gripping portion and wherein the body portion has an integral connecting part formed therein by a generally C-shaped lance. The invention particularly relates in the reforming of the body portion immediately adjacent opposite ends of the C-shaped lance so as to both reinforce the body portion against tearing and to define a positive hinge line.

3,559,843

CLOSURE FOR CONTAINERS

Egon Kern, Graz, Austria, assignor to Dart Industries, Inc., Los Angeles, Calif., a corporation of Delaware

Filed July 26, 1968, Ser. No. 747,998
Int. Cl. B65d 43/10
U.S. Cl. 220—60 6 Claims

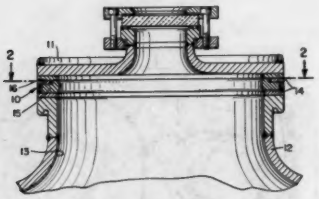


A container and a closure therefore adapted to form a moisture-tight seal and wherein the closure has a skirt that expands or contracts from the normal position to contact the sidewalls of the container as the top of the closure is flexed from one to another of two stable convex configurations.

3,559,844
MANHOLE PROTECTION RING

Seymour Schlosberg, East Brunswick, N.J., assignor to R. Gelb & Sons, Inc., a corporation of New Jersey

Filed June 13, 1969, Ser. No. 832,915
Int. Cl. B65d *25/14, 25/34, 7/42*
U.S. Cl. 220—63 8 Claims

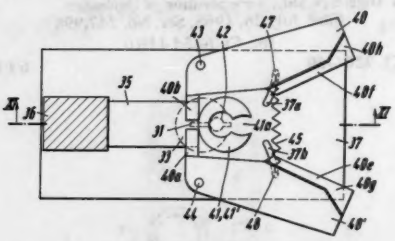


A protection ring for a manhole of a glass-lined vessel includes an annular body member and a replaceable impact member releasably secured in a lateral surface recess of the body member.

3,559,845
DISPENSING DEVICE FOR SLOTTED, APERTURED WASHERS

Richard Klein, Berkheim, and Hugo Weber, Muenchingen, Germany, assignors to Hugo Benzing KG, Muenchingen, Germany, a company of Germany

Filed Dec. 12, 1968, Ser. No. 783,251
Claims priority, application Germany, Dec. 20, 1968, P 16 03 737.9
Int. Cl. B65g *59/00*
U.S. Cl. 221—274 12 Claims

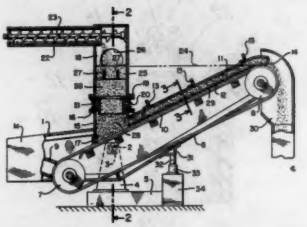


A device for dispensing individual slotted washers has a storage rail adapted to hold an upright stack of washers. A free end of the rail is spacedly adjacent the top face of a stationary base. Individual washers are withdrawn from the gap between the storage rail and the top face by gripping tongs which are guided toward the last washer of the stack through a channel upwardly offset from the top face of the base to permit the jaws of the tongs to slip over the top of a washer lying on the top face for engagement with the aperture in the last washers. Means are provided for shifting the last washer and the remainder of the stack transversely to each other in response to the movement of the tongs through the channel so as to expose the aperture in the last washer for engagement with the tongs.

3,559,846
FEEDING APPARATUS FOR PULVERULENT OR GRANULAR MATERIAL

Niels Erik Hastrup, Copenhagen-Valby, Denmark, assignor to F. L. Smidth & Co., New York, N.Y., a corporation of Delaware

Filed Mar. 26, 1969, Ser. No. 810,546
Claims priority, application Great Britain, Apr. 8, 1968, 16,859
Int. Cl. B67d *5/08*
U.S. Cl. 222—55 6 Claims

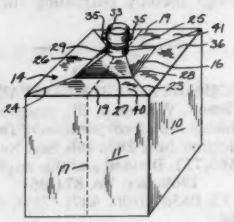


Apparatus for feeding pulverulent or granular material, especially such material which is of a fluidized nature, wherein the material is discharged from the feeding apparatus at approximately a constant rate, as is important in the feeding of cement raw material or raw meal to a rotary kiln in the manufacture of cement.

3,559,847
COLLAPSIBLE SANITARY CONTAINER WITH RETRACTABLE SPOUT

Eugene E. Goodrich, 819 S. Western Ave., Park Ridge, Ill.

Filed Mar. 20, 1968, Ser. No. 714,607
Int. Cl. B65d *37/00*
U.S. Cl. 222—107 3 Claims



A liquid container of flexible plastic material having a top with a central tentlike section having an apex from which a spout projects, said tentlike section being movable from an outwardly projecting condition to an inverted depressed condition to retract the spout, opposite sides of the container having oppositely disposed, upright fold lines connected by fold lines across the top and bottom, and the top and bottom also having intersecting fold lines to provide for collapse when empty, with the collapsed top and bottom having aligned peaks projecting toward one another, the outer portion of the spout being protected by a removable cap.

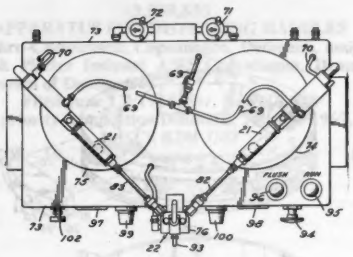
3,559,848
METERED QUANTITY DISPENSER GUNS AND MIXER COMBINATION

Ronald E. Standlick, 4506 Sudbury, Warren, Mich. 48093

Filed Feb. 19, 1969, Ser. No. 800,433
Int. Cl. B67d *5/52*
U.S. Cl. 222—135 8 Claims

An air operated material dispensing gun for emitting metered quantities wherein a piston is advanced and retracted in

an actuation chamber of one housing with the piston having a displacement portion reciprocating in a displacement chamber cylinder of a second housing controlled by a one-way check valve allowing entry and a one-way check valve allowing exit of material to and from the displacement chamber respectively in conjunction with advancing and retracting strokes of the piston. The housings are divided by a nipple and seals through which the piston reciprocates with the nipple having a chamber, a radial relief and an atmospheric vent defining a neutral zone between the housings preventing air leaking to the material chamber and material from leaking to the air chamber. Two or more guns feed metered quantities of different materials to a driven mixer which blends the materials into a homogenized mixture and emits a metered amount of the mixture to use. The guns have an adjustable stop for limiting piston travel to adjust the metered quantity emitted by each gun and the cumulative quantity emitted by the mixer.



3,559,849

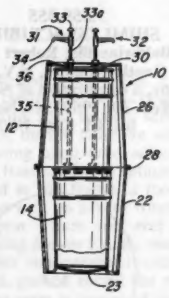
HAND-CLEANING-COMPOUND DISPENSING STATION

Selwyn Ancel, River Forest, Ill., assignor to Chemtrust Industries Corporation, Maywood, Ill., a corporation of Delaware

Filed Oct. 31, 1968, Ser. No. 772,144

Int. Cl. B65d *47/34*

U.S Cl. 222—143 **10 Claims**



A hand-cleaning compound dispensing station including a plurality of containers of liquid hand-cleaning compound arranged on a floor surface stacked one on top of the other with the uppermost container being uncovered. An outer housing is placed about the stack of containers which housing has a top wall which overlies the uppermost container. One or more dispensing pumps are mounted on the top wall to dispense hand-cleaning compound from the uppermost container. A recess is formed on the top wall to provide a trough to receive drippings of liquid hand-cleaning compound from the pumps. The outer housing is preferably formed of two similarly sized lower and upper halved sections each of which have tapered walls so that the housing portions may be placed one into the other.

3,559,850

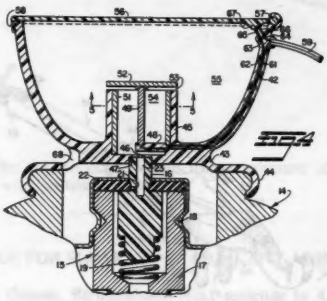
METHOD OF AND DEVICE FOR HEATING PRODUCT DISPENSED FROM AEROSOL CONTAINER

Stanley M. Barkin, Somerville, and Alan Dillarstone, Highland Park, N.J., assignors to Colgate-Palmolive Company, New York, N.Y., a corporation of Delaware

Continuation of application Ser. No. 686,420, Nov. 29, 1967, now abandoned. This application May 7, 1969, Ser. No. 822,747

Int. Cl. B67d *5/62*

U.S. Cl. 222—146 **4 Claims**



A heater assembly for warming shaving cream being dispensed under pressure from an aerosol-type container which comprises a head adapted to be mounted on the depressible discharge valve stem of the container and having an internal chamber wherein discharging shaving cream flows through an annular passage between concentric electrodes electrically connected to a source of alternating current, the cream being conductive and heated by electrical action. In a specific form the warmed shaving cream collects in a cup closed by a hinged cover that controls a switch in the electrode circuit to close that circuit only when the cover is closed and open the circuit when the cover is open.

3,559,851

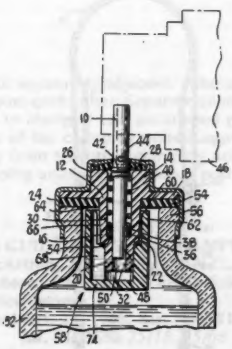
FULLY-EMPTYING VALVE ASSEMBLAGE

Wolf Steiman, Fairfield, Conn., assignor to Valve Corporation of America, Bridgeport, Conn., a corporation of Delaware

Filed May 27, 1969, Ser. No. 828,122

Int. Cl. B65d *83/14*

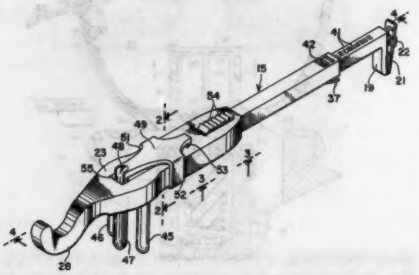
U.S. Cl. 222—402.2 **5 Claims**



An aerosol valve assemblage comprising a tubular valve housing for disposition within a container, said housing having an end inlet opening and carrying a collector cup the rim and adjoining portions of which are slightly spaced from the

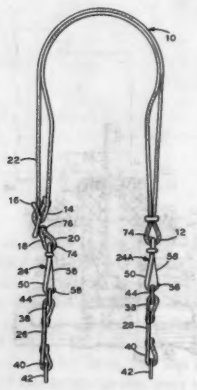
valve housing and sealing gasket thereon. The said spacing constitutes a collecting area into which the last amount of liquid product can collect, to be dispensed through the valve housing when the container is in inverted position.

3,559,852
TROUSER MEASURER AND HANGER
Edward C. Green, 36 W. 35th St., New York, N.Y. 10001
Filed June 19, 1969, Ser. No. 834,845
Int. Cl. A47j *51/14*
U.S. Cl. 223—96 10 Claims



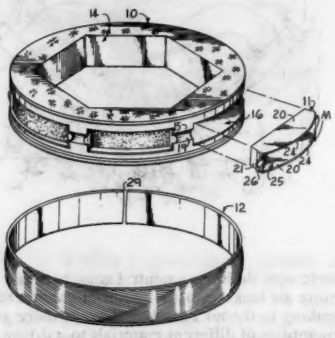
A trouser measurer and hanger that will display the waist size of the trouser secured thereto. Telescoping parts of the hanger are spring biased relative to each other so that the front portion of the trousers can be folded inwardly over two depending fingers carried by the main body and the trousers clamped by their waist portion to the hanger. The hangers are provided with projections to support the trousers on wall or rod supports at different elevations depending upon the length of the trousers. A trouser cuff table adjustable to different elevations receives the trouser cuff so that the length of the trouser will be measured from their different elevations of their wall supports.

3,559,853
CAMERA STRAP WITH FREE-FLOATING LOOPS AT BOTH ENDS
Robert H. Strassman, 147 11 34th Ave., Flushing, N.Y. 11354
Filed Apr. 14, 1969, Ser. No. 815,813
Int. Cl. A45f *5/00*
U.S. Cl. 224—5 4 Claims



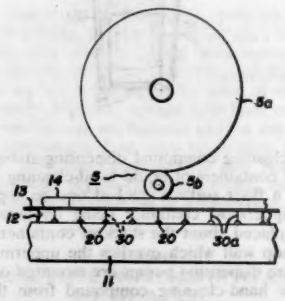
A camera shoulder strap provided at each end with a loop having attached thereto a snap clip provided with a fully rotatable head, to permit free and easy complete rotary self-positioning of the clip as attached respectively to two separate side brackets of a camera, to permit an immediate fast positioning of a camera from supported position on the shoulder, to operating position in front of the body, without restraint due to usual twisting of the shoulder strap.

3,559,854
MAKEUP BRACELET
Olga H. Loveland, 5 Glen Erroll Road N.W., Atlanta, Ga.
Filed Oct. 3, 1968, Ser. No. 764,864
Int. Cl. A44c *5/00*; A45d *33/18*
U.S. Cl. 224—28 5 Claims



A makeup bracelet in which cosmetics are carried for use by the wearer. The bracelet comprises generally an annulus having a central passage therethrough through which the wearer inserts her arm, a groove extending around the periphery of the annulus and a plurality of radially spaced recesses formed in the annulus. A plurality of cosmetic cartridges are received in the recesses around the periphery of the annulus and are provided with projections for locking the cartridges in place in the recesses. Lips are provided on the cartridges for removing the cartridges from the recesses. A secondary groove extends between each of the recesses for receipt of the lips of the cartridges therein and a cover ring fits within the peripheral groove around the annulus to cover the cartridges in the recesses.

3,559,855
SHIMLESS SCRIBING
Jack R. Barnett, Baldwinsville; Robert W. Brown, Liverpool, and Francis C. Gantley, Fulton, N.Y., assignors to General Electric Company, a corporation of New York
Filed Feb. 19, 1969, Ser. No. 800,535
Int. Cl. B26f *3/00*
U.S. Cl. 225—2 7 Claims



This invention relates to a method of subdividing a semiconductor wafer. Marks are scribed on a selected surface of the wafer along predetermined scribe passages thereby producing fracture loci under the marks. The wafer

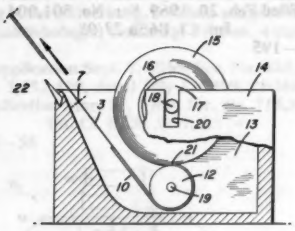
is then placed on a pad of resilient material. One surface is then covered with a thin sheet of flexible material capable of direct adhesion to the wafer that acts as a temporary pellet carrier. Next a compressive load is induced along the scribe marks by moving a compressive member in engagement with the covered surface of the wafer thereby fracturing the wafer into individual pellets such that they are individually adhered to the flexible sheet in essentially the same position they occupied in the parent wafer prior to the fracturing of the wafer.

3,559,856

APPARATUS FOR DISPENSING HANDLES

Vagn Fehrn-Christensen, Copenhagen, Denmark, assignor to Nordisk Plaster Industri A/S., Copenhagen, Denmark, a corporation of Denmark

Filed June 13, 1968, Ser. No. 736,678
Claims priority, application Denmark, July 11, 1967, 3561
Int. Cl. B26f *3/02*
U.S. Cl. 225—10 **1 Claim**



An apparatus for dispensing from a reel substantially uniform lengths of a continuous series of articles, such as carrying handles consisting of a flexible self-adhesive strip the central part of which, on the adhesive side, is covered by a flexible material leaving uncovered adhesive ends. The apparatus comprises a frame, a freely rotatable reel carrying the articles and mounted in the frame, a freely rotatable roller mounted in the frame with its axis of rotation parallel to that of the reel and upon which the reel rests and rotates therewith, and a cutting means fixedly mounted in the frame spaced from the roller and parallel thereto. The strip is unwound from the reel, passed round the roller and over the cutting means. As the strip is unwound there will be periods of high resistance, as the adhesive is pulled from the reel, and low resistance, as the covered portion is unwound. The dimensions of the apparatus and strip are such that when high resistance is encountered this indicates that the predetermined length has been unwound.

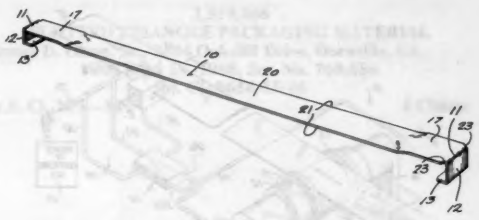
3,559,857

TEAR STRIP FOR ROLLED SHEET MATERIAL

William J. Van Dyck, Marinette, Wis., assignor to Badger Paper Mills, Inc., Peshtigo, Wis., a corporation of Wisconsin

Filed Oct. 25, 1968, Ser. No. 770,583
Int. Cl. B26f *3/02*
U.S. Cl. 225—56 **3 Claims**

This disclosure relates to a tear strip for rolled sheet material in which the cutting strip has its ends bent to fit around the edges of the roll, said strip having a greater curva-



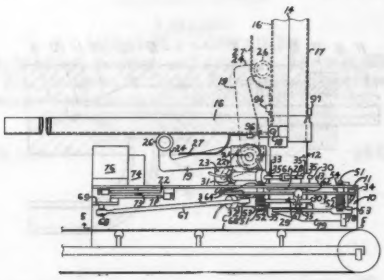
ture than the roll to concentrate finger pressure along the strip edges while cutting.

3,559,858

APPARATUS FOR SEPARATING ADJACENT ADHERENT ROLLS

Belmont D. Osteen, Birmingham, Ala., assignor to American Design, Inc., Birmingham, Ala., a corporation of Alabama, a part interest

Filed Feb. 12, 1968, Ser. No. 704,767
Int. Cl. B26f *3/00*
U.S. Cl. 225—102 **10 Claims**



Apparatus for separating adjacent, adherent rolls of paper-like material from each other. Separate clamping units movable selectively to clamped and unclamped position surround each roll. One of the clamping units is movable both angularly and away from the other clamping unit simultaneously while the clamping units are in clamped position.

3,559,859

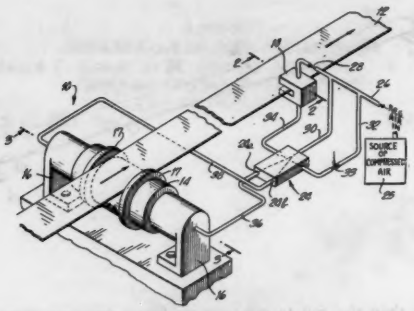
WEB GUIDE USING FLUID AMPLIFIER

Colin Shaw McArthur, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C., a corporation of New Jersey

Filed Oct. 29, 1968, Ser. No. 771,495
Int. Cl. B65h *25/18, 25/08*
U.S. Cl. 226—19 **3 Claims**

A web shifting device, for accurately and instantaneously correcting deviations in the lateral position of a longitudinally travelling web from a normal position, including a sensing device having opposed fluid flow apertures, defining one or a plurality of fluid flow paths which are normally partially restricted by the edge of the moving web, a proportional fluid amplifier controlled by the pressures developed

by variations of fluid flow in the apertures caused by the displacement of the edge of the web, and motor means con-



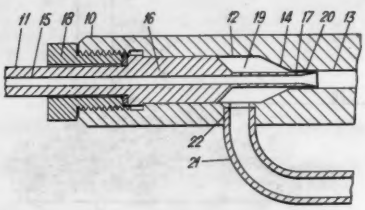
trolled by the amplifier and driving a laterally movable web guide to maintain the web in its normal position.

3,559,860

TEXTILE YARN HANDLING DEVICES

Malcolm John East, and Brian Beddoe, Pontypool, England, assignors to Imperial Chemical Industries Limited, London, England, a corporation of Great Britain

Filed June 24, 1968, Ser. No. 739,552
Claims priority, application Great Britain, Dec. 18, 1967, 57368/67
Int. Cl. B65h *51/16*
U.S. Cl. 226—97 **7 Claims**



A yarn handling device comprising in combination a driving air inlet tube having a first portion surrounding an entrained air and yarn inlet tube and an air and yarn outlet portion arranged to receive both driving and entrained air, said outlet portion having a cross-sectional area of similar dimensions to that of said driving air inlet tube where they abut, and said driving air inlet tube being so arranged that the driving air is accelerated along it, thereby entraining air along the said entrained air and yarn inlet tube, wherein said driving air enters said outlet portion in a direction substantially parallel to the general direction of flow of entrained air.

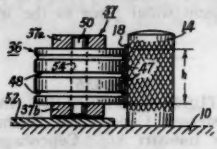
3,559,861

PRESSURE MEMBER AND GUIDE FOR MAGNETIC TAPE

Austin A. Knox, Stamford, Conn. (Topstone Road, Ridgefield, Conn. 06877)

Filed June 15, 1967, Ser. No. 646,276
Int. Cl. G11b *15/28*
U.S. Cl. 226—168 **10 Claims**

This disclosure comprises a pressure member for urging magnetic recording tape against the capstan in the tape transport. The pressure member is of a height less than the width of the tape and accordingly, the pressure member engages only the back side of the tape. One embodiment of the pressure member does not rotate and to accommodate tape splices has a plurality of base screws over its face for the threading of tape splices. The pressure member can be positioned by a bifurcated support in a magnetic tape cartridge for precise orientation of the pressure member. For aligning the tape there is disclosed a spoollike guide member at the



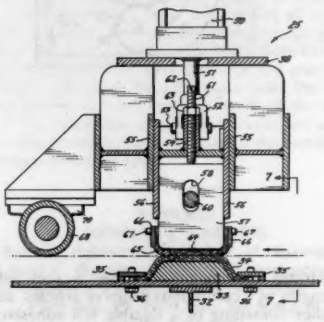
forward edge of the tape cartridge, the spool being vertically movable as it engages a rigid guide member on the machine to position the spool and the tape with respect to the transducer head.

3,559,862

DRAG WIPE

Richard Jablin, Blue Bell, Pa., and Robert G. Leister, Ambler, Pa., assignors to Alan Wood Steel Company, Conshohocken, Pa., a corporation of Pennsylvania

Filed Feb. 20, 1969, Ser. No. 801,004
Int. Cl. B65h *23/08*
U.S. Cl. 226—195 **5 Claims**



A drag wipe which selectively varies the overall pressure applied on all the slit strips or mults and also the pressure on individual mults, with provision for receiving a loop from some of the mults in a looping pit. The drag wipe can open for insertion of the mults.

3,559,863

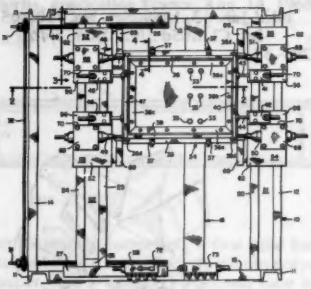
APPARATUS FOR THE PRODUCTION ASSEMBLY OF ARTICLES OF FURNITURE OR THE LIKE

Arthur Sack, 240-37 De Pew Ave., Douglaston, N.Y., and Stephen A. D'Alessio, 209-02 43rd. Ave., Bayside, N.Y.

Filed Apr. 3, 1969, Ser. No. 812,985
Int. Cl. B25c *7/00*
U.S. Cl. 227—152 **6 Claims**

The invention is directed to a novel production machine for articles of furniture or the like (e.g., boxes, display assemblies, packaging or other assembly of parts), utilizing automatic fastening equipment, such as staple guns. The invention is particularly characterized by the provision of simplified, universally adjustable facilities for the mounting and

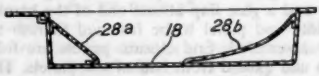
manipulating of the staple guns, during an assembly operation, enabling the assembly to be completed rapidly and expeditiously. Resetting of the machine for various configurations of assembly articles is greatly facilitated with the equipment of the invention.



3,559,864
WELDING WIRE OR WELDING ROD
Lars Hilding Hillert, Goteborg, Sweden, assignor to Elektriska Svetsningsaktiebolaget, Goteborg, Sweden, a corporation of Sweden
Original application Sept. 7, 1965, Ser. No. 485,594, now Patent No. 3,452,419, dated July 1, 1969. Divided and this application Mar. 25, 1968, Ser. No. 715,924
Int. Cl. B23k *3/06, 35/14*
U.S. Cl. 228—56 **2 Claims**

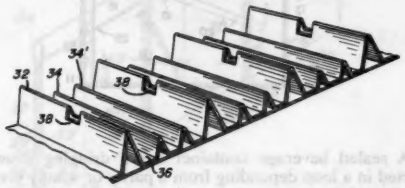
A welding wire or welding rod comprising a metallic sheath composed of grains or granules of inorganic welding materials embedded in and bonded by a solidified matrix consisting of an inorganic anhydrous compound selected from the group comprising chromium oxides and boric oxide.

3,559,865
BACON CONTAINER
John C. Field, Park Forest, Ill., assignor to Armour and Company, Chicago, Ill., a corporation of Delaware
Filed Sept. 1, 1967, Ser. No. 665,036
Int. Cl. B65d *1/00;* **B65b** *25/06*
U.S. Cl. 229—2.5 **1 Claim**



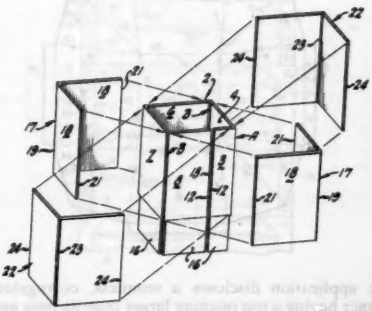
A container for a draft of sliced, shingled bacon having a curved top surface and a relatively flat underside, wherein the container has vertical end walls and a bottom portion having an interior surface conforming to the general contour of the top surface of the bacon draft.

3,559,866
SLOTTED TRIANGLE PACKAGING MATERIAL
James D. Olson, Sr., 3304 Oakcliff Drive, Doraville, Ga.
Filed Sept. 19, 1968, Ser. No. 760,856
Int. Cl. B65d *85/48*
U.S. Cl. 229—14 **4 Claims**



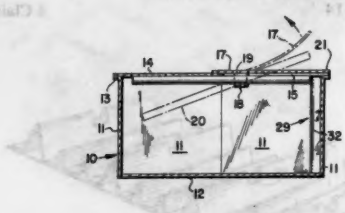
A carton liner fabricated from a paperboard strip deformed so that triangular projections of two different sizes extend inwardly from the interior wall of a carton. The larger triangular sections include slots formed centrally within each apex edge for accommodating a platelike article having its edges disposed within the aligned slots. The smaller triangular projections provide lateral support for the article retained within the slots.

3,559,867
MULTI-PLY CONTAINER
Billy J. Muskopf, Houston, and Arthur T. Edwards, III, Dallas, Tex., assignors to Crown Zellerbach Corporation, San Francisco, Calif., a corporation of Nevada
Filed Mar. 28, 1969, Ser. No. 811,553
Int. Cl. B65d *25/14, 5/56*
U.S. Cl. 229—14 **15 Claims**



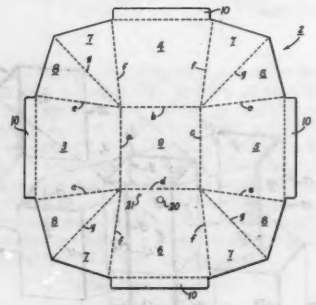
A multi-ply container desirably of paperboard panels laminated together, has a corner construction comprising facing unattached end edges of a ply covered by an integral hinge connection between wall panels of another ply thereby eliminating a so-called manufacturer's joint. The corner construction and plurality of laminated plies provide bulge resistance rendering the container particularly advantageous for the packaging of flowable products such as synthetic rubber blocks.

3,559,868
COMBINATION BEVERAGE CONTAINER AND DRINKING STRAW
Henry M. Chang, Bronx, N.Y., assignor to First Dynamics, Inc., New York, N.Y., a corporation of New York
Filed June 2, 1969, Ser. No. 829,425
Int. Cl. B65d *17/00, 17/06, 47/00, 83/00*
U.S. Cl. 229—7 11 Claims



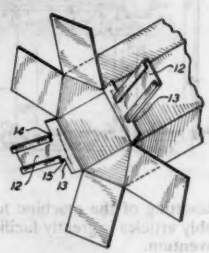
A sealed beverage container has a drinking straw supported in a loop depending from a partly or wholly severable portion of the container cover. In one form such portion is a patchlike tear strip covering a slot in the cover, the slot being wider than the straw and preferably extending from the corner of the cover part way along a diagonal. In another form such portion is coplanar with and integral with the cover, the latter being provided with two niches in the circumferential edge thereof preferably spaced equidistant from a corner thereof, the tip of the corner between the niches being adapted to be grasped to tear the portion upward out of the plane of the cover. In both forms the straw is simultaneously tilted upward for extraction from the loop. Additional provision is made for standing the extracted straw upright in the corresponding corner of the container.

3,559,869
BEVERAGE COOLER
John J. Reynolds, Bloomfield, N.J. (c/o Reynolds Electric Co., 608 Broadway, Newark, NJ 07104)
Filed Nov. 29, 1968, Ser. No. 779,980
Int. Cl. B65d *5/22, 5/24;* B67d *5/62*
U.S. Cl. 229—31 1 Claim



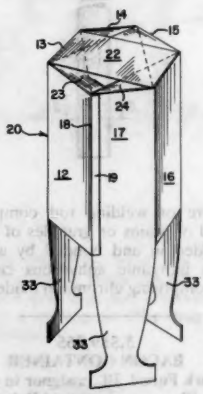
The application discloses a seamless, corrugated paper container having a top opening larger than its base and therefore capable of being nested with like containers. There is disposed therein a keg, bottle or the like of beverage desirably maintained in a cool state. The container may be coated with a moisture proof plastic and a coolant, such as ice, is disposed between the keg and the inner wall structure of the container. The latter is provided with a breakable aperture portion to receive a spigot assembly which communicates with the interior of the keg. The container also has a weakened area to receive, if desired, a drain hose, such area being below the expected water level of the container when the ice is substantially melted. Alternatively, the container is usable as an ice bucket in which case the weakened portions are not broken through.

3,559,870
HEXAGONAL CONTAINER HAVING A HANDLE FORMED FROM OVERLAPPING END FLAPS
Philip A. Petruzzellis, White Plains, N.Y., assignor to Litton Business Systems, Inc., Orange, N.J., a corporation of New York
Filed Jan. 13, 1969, Ser. No. 790,805
Int. Cl. B65d *5/02, 5/08, 5/46*
U.S. Cl. 229—37 3 Claims



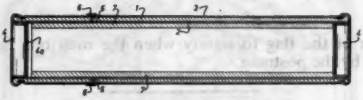
A hexagonal one piece container for shipping rolls of light sensitive photocopy paper. The entire container is constructed from one integral sheet of material with the end walls formed by overlapping extensions of the sidewalls. Two of these overlapping extensions may be interlocked and slightly bowed to form a handle.

3,559,871
MODULAR DISPOSABLE FOLDABLE CONTAINER
James N. Vaughn, 1015 River Drive, Hammond, Ind. 46324
Filed Sept. 19, 1968, Ser. No. 760,939
Int. Cl. B65d *5/08*
U.S. Cl. 229—39 3 Claims



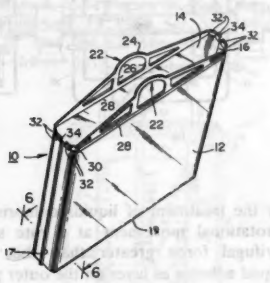
A hexagonal or octagonal container made from an integral blank including six or eight panels forming the sides of the container and a glue flap at one end of the blank to overlie the opposite end panel to be fastened thereto to hold the container assembled. End closure panels are foldably connected to and extend from half of the panels. The end closure panels include fastening flaps attachable to the opposite side panel of the container. Extending from the side panels located between the end closure flaps and rigid therewith there may be supporting legs.

3,559,872
PACKING CONTAINERS
Pierre Jean Riboud, Levallois-Perret, France, assignor to Societe Anonyme Lincrusta, Paris, France
Filed Mar. 13, 1969, Ser. No. 806,877
Claims priority, application France, Aug. 14, 1968, 3547
Int. Cl. B65d *3/22*
U.S. Cl. 229—51 10 Claims



A cardboard container comprising a first tube lined internally and externally with hot-sealed aluminum-polyethylene, polyethlene-paper or the like, and a second tube inside the lined tube, the first tube being closed by crimped end caps and externally circumferentially partially incised, the incision being closed off by an adhesive tape.

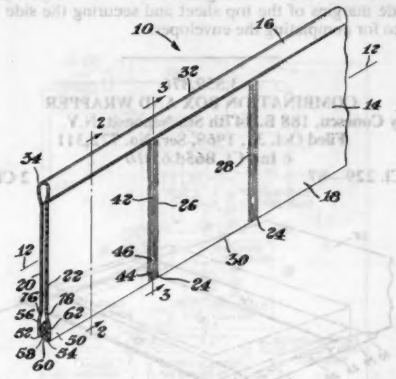
3,559,873
BAG WITH TOTE HANDLE
Robert L. Hart, Manhasset Hills, N.Y., assignor to W.R. Grace & Co., a corporation of Connecticut. by mesne assignments
Filed Sept. 9, 1969, Ser. No. 856,306
Int. Cl. B65d *33/08*
U.S. Cl. 229—54 11 Claims



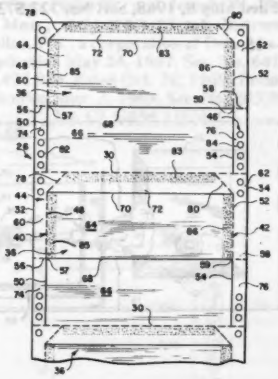
A plastic tote handle supports a gusset bottom bag and includes two bails, each of which is molded in one-piece with a horizontal bag-supporting bar. The bars are heat sealed along their lengths to the full widths of the inner surfaces of front and back plastic film bag-forming panels adjacent the upper edges thereof. The bars include integral vertical "living hinges" near their opposite ends so that the end portions thereof may be readily bent to positions roughly perpendicular to the bars. Thereby, as the bag is filled, the marginal side edges of the front and back bag panels will move apart at their upper portions and will bend to conform to the perpendicular positions of said strip portions, thus forming well-defined square sidewalls for the bag.

3,559,874
SERIES BAG CONSTRUCTION
Oliver R. Titchenal, Berea, Ohio, assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware
Filed May 8, 1968, Ser. No. 727,464
Int. Cl. B65d *27/10*
U.S. Cl. 229—69 23 Claims

A bag construction embodied in a chain of connected bag elements and an efficient method for filling the same. In novel feeding and mounting concepts, the chain of bag elements is preferably fed to the filling apparatus from a folded pile, and is initially received by a mandrel which mounts the same in a curtain-and-rod-like fashion by means of a loop or tunnel located along the top end of each bag. In the chain, the bag elements are substantially separated from one another such that their complete separation after filling can be easily achieved, as for example, by a gentle pulling action. In specific bag constructions, loading or filling through gusseted sections of the bag elements is made possible through novel gusset designs and filling methods, and scrap minimized, for example, by thinning strategic portions of the bag elements which later are customarily trimmed therefrom following sealing operations.



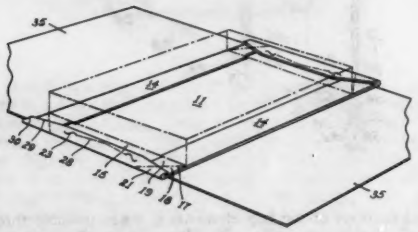
3,559,875
CONTINUOUS ENVELOPE FORM
Paul O. Wilson, Severna Park, Md. (3132 Frederick Ave., Baltimore Md. 21229)
Original application Aug. 9, 1968, Ser. No. 751,467. Divided and this application Nov. 6, 1969, Ser. No. 871,089
Int. Cl. B65d *27/10*
U.S. Cl. 229—69 5 Claims



A continuous forms press converts a roll of envelope paper into a continuous envelope form having a plurality of transverse perforated lines dividing the form into envelope blanks, a plurality of transverse score lines defining fold lines on the envelope blanks, longitudinal perforated lines and score lines defining side trim zones and side flaps, lines of sprocket holes along the side margins of the form, and adhesive coatings on a seal flap and adjacent side margins of a top sheet of each blank. The press folds the continuous form into a zigzag folded stack suitable for feeding into a computer printout device or automatic typewriter where the forms are automatically addressed from addresses contained in a tape or punch card memory. The continuous form is again folded

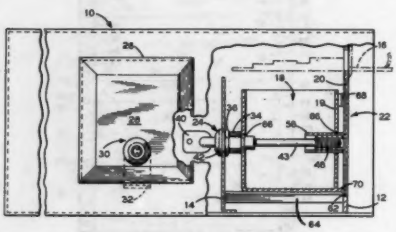
into a zigzag stack and fed into a continuous forms envelope converter which includes means for separating the continuous form into separate envelope blanks, means for trimming the side trim zones from the blanks, means for folding over the side flaps, means for folding over a top sheet of each blank over a bottom sheet thereof along a transverse fold line, and means for activating the adhesive coatings adjacent the side margins of the top sheet and securing the side flaps thereto for completing the envelopes.

3,559,876
COMBINATION BOX AND WRAPPER
Sidney Conescu, 188 B. 147th St., Neponsit, N.Y.
Filed Oct. 31, 1968, Ser. No. 772,311
Int. Cl. B65d *65/10*
U.S. Cl. 229—87 **2 Claims**



An improved top load folding box construction combined with attached sheet of wrapping paper of the proper size and in the desired position to overwrap said box, said box having strengthened and durable corners in its setup position with reinforced front laps.

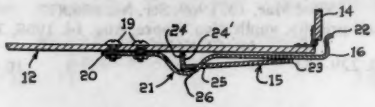
3,559,877
INTERNAL COLLECTION SYSTEM FOR A COIN OPERATED SYSTEM
Harry Greenwald, Whitestone, and Salvatore Iglio, Richmond Hill, N.Y., assignors to Greenwald Industries Inc., Belleville, N.J., a corporation of Delaware. by mesne assignments
Filed May 8, 1968, Ser. No. 727,573
Int. Cl. G07f *1/00*
U.S. Cl. 232—15 **3 Claims**



A coin collection system having internal locking means for preventing unauthorized access to the coin box of a coin operated device.

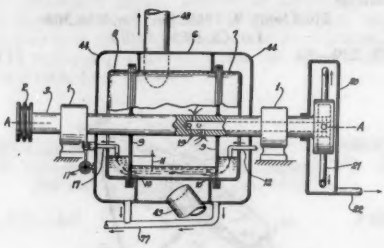
3,559,878
MAIL BOX SIGNAL
George Roeder, Box 3931, Odessa, Tex. 79760
Filed July 14, 1969, Ser. No. 841,316
Int. Cl. A47g *29/12*
U.S. Cl. 232—35 **7 Claims**

A mail box signal device attached to a rural mail box which includes a resilient latch means which retains a flag in a retracted or extended position. The resilient latch means is actuated by the mail box closure means so as to cause the



position of the flag to signify when the mail box has been opened by the postman.

3,559,879
MEANS FOR THE TREATMENT OF LIQUID TO EFFECT COOLING, WARMING, VAPORIZATION, SEPARATION, PURIFICATION AND THE LIKE
Emile Bechard, Paris, France, assignor to Rene G. LeVaux, a part interest to
Original application Apr. 1, 1964, Ser. No. 356,434, now Patent No. 3,396,088, dated Aug. 6, 1968. Divided and this application July 5, 1968, Ser. No. 810,393
Int. Cl. B04b *15/02*
U.S. Cl. 233—11 **7 Claims**

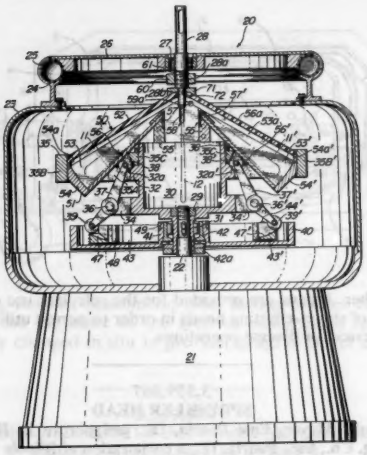


A device for the treatment of liquids comprising a drum mounted for rotational movement at a rate sufficient to generate centrifugal force greater than that of gravity, whereby the liquid adheres as layer on the outer periphery of the drum and means communicating the outer peripheral portion of the drum with an outlet whereby the layer of liquid on the peripheral surface of the drum separates in response to gravity during rotational movement of the drum with the heavier and colder liquid adjacent the outer peripheral surface, with the lighter and warmer liquid at the interior surface of the liquid layer to enable separation or fractionation thereof.

3,559,880
APPARATUS FOR BLOOD PLASMA SEPARATION
Ryoichi Naito, and Osamu Yamaji, Osaka, Japan, assignors to The Green Cross Corporation, Osaka, Japan, a corporation of Japan
Filed Feb. 3, 1969, Ser. No. 795,934
Claims priority, application Japan, Oct. 3, 1968, 43/86264
Int. Cl. B04b *1/00, 9/14*
U.S. Cl. 233—26 **1 Claim**

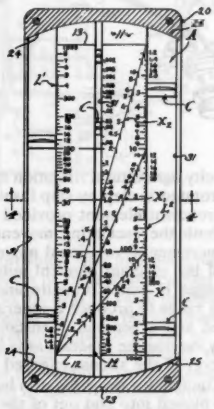
An apparatus for centrifugally separating blood plasma from red blood cells, said apparatus being adapted for use with a blood bag set composed of a pair of mother bags and a daughter bag communicating therewith, said apparatus comprising a blood bag receiving box of generally inverted V-shape cross section having a pair of bottom plates hinged for upward movements, rotary drum, flywheel of larger inertia than that of the drum and a mechanism operable, after completion of blood plasma separation within said mother bags and after switching off of the power source of the apparatus, to upwardly urge the bottom plates of the blood bag

box against the cover thereof by virtue of the difference in inertial rotation between the drum and the flywheel to



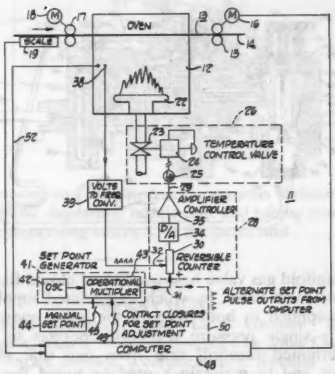
thereby automatically squeeze the separated fluid of blood plasma out of the mother bags into the daughter bag.

3,559,881
NOMOGRAM COMPUTER
Richard L. Maison, 6624 Forum St., San Diego, Calif. 92111
Filed Sept. 13, 1968, Ser. No. 759,620
Int. Cl. G06c *3/00*
U.S. Cl. 235—61 **19 Claims**



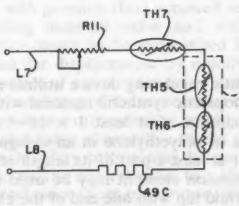
An instrument for solving mathematical problems and involves nomograms that enable the manipulation of a straight line to read off the value of a dependent variable when the value of an independent variable is given, thereby computing by means of graphic representation systemmatic solutions to said problems capable of numerical calculation. With this invention there are immovable scales and it is the calculating line that is moved by manipulation to intersect the said scales at read-off points where memory indicators are positioned for reference, there being a plurality of calculating lines and a multiplicity of memory indicators operable at each and/or both sides of the instrument, which is accordingly capable of the basic mathematics of addition, subtraction, multiplication and division, and also other functions such as subjection of variables to roots, exponents and reciprocals.

3,559,882
PROCESS DIGITAL CONTROL
Howard E. Jordan, Euclid, Ohio, assignor to Reliance Electric Company, a corporation of Delaware
Filed Mar. 20, 1969, Ser. No. 808,787
Int. Cl. G06f *15/46*; **G06s** *7/66*
U.S. Cl. 236—15 **15 Claims**



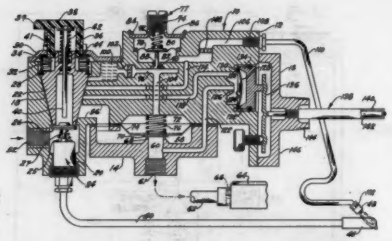
An oven is a load in a process and the control acts through a partly digital and partly analogue loop with a digital controller to control the temperature of the oven. The digital controller has a comparator with two inputs, one in the partly digital/analogue loop and the other from a set point generator which is used to change the set point and hence the temperature of the oven. This set point generator is controlled either manually or by a digital computer having a temperature-sensing feedback from the oven.

3,559,883
TEMPERATURE CONTROL
Francis P. Buiting, Plainville, and Joseph W. Waseleski, Jr., Mansfield, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex., a corporation of Delaware
Original application May 24, 1967, Ser. No. 641,027, now Patent No. 3,474,963, dated Oct. 28, 1969. Divided and this application Mar. 3, 1969, Ser. No. 803,861
Int. Cl. G05d *23/24*
U.S. Cl. 236—68 **6 Claims**



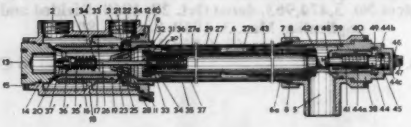
The apparatus disclosed herein proportionally controls a gas-burning heating system to maintain a zone to which heat is supplied at a predetermined temperature level. The flow of gas is varied by a valve the setting of which is adjusted by means of an electrically energized, thermal expansion actuator. A thermistor is provided for sensing the temperature in the controlled zone and the actuator is energized according to a predetermined function of the resistance of the thermistor thereby to maintain the temperature in the zone at the predetermined level.

3,559,884
GAS VALVE
Charles C. Visos, and John J. Love, St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo., a corporation of Missouri
Filed Feb. 19, 1969, Ser. No. 800,596
Int. Cl. F23n *5/04*
U.S. Cl. 236—80 **6 Claims**



A manifold gas valve having a biased closed fluid-pressure-operated main valve, in which unregulated supply line pressure is applied to both sides of the valve operator, and in which a single pressure regulator operates to maintain a predetermined bleedoff rate from one side of the valve operator and to maintain a predetermined flow to a pilot burner under conditions of varying supply line pressure.

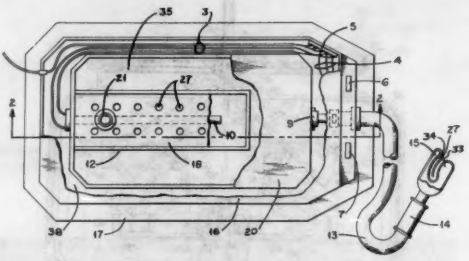
3,559,885
THERMOSTATIC REGULATING DEVICE WITH A SYNTHETIC THERMOPLASTIC EXPANSION ELEMENT
Willem Antonius Boekelman, Sr., and Willem Antonius Boekelman, Jr., Venlo, Netherlands, assignors to N. V. Metaalwarenfabriek "Venlo", Venlo, Netherlands
Filed Mar. 26, 1968, Ser. No. 716,153
Claims priority, application Netherlands, Mar. 31, 1967, 67.04634
Int. Cl. G05d *23/02*
U.S. Cl. 236—93 **8 Claims**



A thermostatic regulating device utilizes an expansion element of thermoplastic synthetic material with a thermal coefficient of expansion of at least 1×10^{-4} mm/° C. such as polypropylene or polyethylene in an elongated shape with a thickness over at least a part of its length of not more than 2 mm. The expansion element may be used in a combination hot and cold fluid tap with one end of the element connected to a valve member and the other end adjustably connected to the housing.

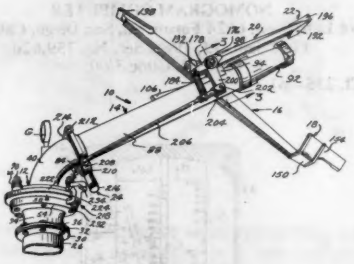
3,559,886
PORTABLE STEAM GENERATING UNIT
Mary Lee Howard, P.O. Box 661, Poughkeepsie, N.Y. 12601
Filed Oct. 29, 1968, Ser. No. 771,402
Int. Cl. B05b *1/24*
U.S. Cl. 239—136 **10 Claims**

A unit with no moving parts adapted to generate steam in response to an electric heating element, wherein the water chamber is separated from a steam chamber which, in turn, is separated from the atmosphere by a further protective



chamber. Means are provided for the selective use of a plurality of steam-emitting heads in order to permit utilization of the device for diverse operations.

3,559,887
SPRINKLER HEAD
Larry P. Meyer, East Peoria, Ill., assignor to L. R. Nelson Mfg. Co., Inc., Peoria, Ill., a corporation of Illinois
Filed May 8, 1969, Ser. No. 823,026
Int. Cl. B05b *3/08*
U.S. Cl. 239—233 **15 Claims**

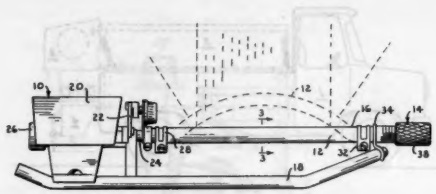


A high capacity agricultural irrigation sprinkler head of the type which is rotated in step by step fashion by an oscillating arm having a reactant element provided with fixed surfaces for effecting both the oscillating movement of the impulse arm and the incremental rotational movements of the head, the surfaces of the reactant element automatically compensating for changes in water pressure and nozzle outlet size through a wide range to produce a generally constant oscillatory arm speed and a generally constant intermittent rotational speed by varying the reactant area in response to variation in the energy of the stream engaged thereby. The sprinkler head also includes a reversing arm having a reactant element which is moved into and out of the stream by an overriding cam mechanism, the reactant element being normally biased out of the stream and retained in the stream when initially moved therein by the cam mechanism solely by the action of the stream thereon against its normal bias, thus preventing accidental start up during the reversing cycle and severe shock or damage due to override at the normally operable beginning and end of the reversing cycle.

3,559,888
LAWN SPRINKLER WITH FLEXIBLE NOZZLE
Louis F. Miklos, 6151 Delaware St., Gary, Lake County, Ind.
Filed Nov. 18, 1968, Ser. No. 776,523
Int. Cl. B05b *3/16*
U.S. Cl. 239—242 **3 Claims**

An improvement in a lawn sprinkler which conventionally employs a horizontally disposed, fixedly arched or bowed

tube, having orifices therein, which oscillates to and fro to distribute the water in a fixed fan shape, comprising the replacement of the fixedly arched or bowed tube with a

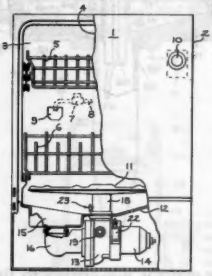


manually flexible, elastomeric tube, having orifices therein, so that the curvature of the arch or bow thereof may be manually changed in situ to provide sprays of select dimension.

3,559,889
DISHWASHER WITH IMPROVED MEANS FOR REDUCING LIQUID CARRYOVER

Lauren W. Guth, Louisville, Ky., assignor to General Electric Company, a corporation of New York

Filed May 7, 1969, Ser. No. 822,418
Int. Cl. B05b *3/06*
U.S. Cl. 239—251 **9 Claims**



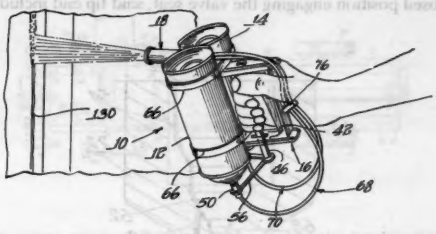
A dishwasher is provided with improved means for reducing the amount of wash or rinse water carried over from one cleaning operation to the next. A valve positioned in the conduit leading to the spray means of the dishwasher opens after each cleaning operation while the wash or rinse water is being emptied to the drain. The opening of the valve allows the spray means and the supply conduit to empty so that very little water is trapped in them for mixing with the fresh water introduced for the next cleaning operation. The illustrated valve comprises a resilient member which is held over an opening in the conduit wall by the water pressure during each cleaning operation but which drops away from the opening and permits drainage therethrough when the water pressure in the conduit is relieved.

3,559,890
FOAM DISPENSER

William R. Brooks, 365 Alexander, Elmhurst, and Irving C. Heinzel, 1565 Webster Lane, Des Plaines, Ill. 60010

Filed Sept. 3, 1968, Ser. No. 756,787
Int. Cl. B05b *11/00*
U.S. Cl. 239—304 **9 Claims**

Dispenser apparatus for multicomponent products comprises a pair of containers each having its own dispensing valve. A bracket is arranged to hold the containers in fixed position and includes a manual trigger. Links are provided for connecting the trigger with the valves for actuation of the

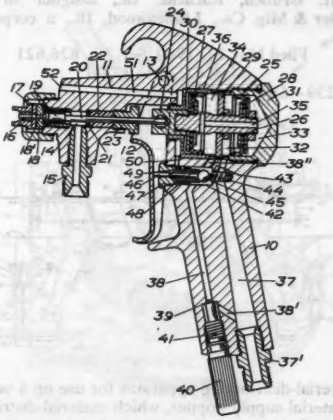


valves in unison; and the dispenser apparatus additionally includes a remote dispensing nozzle unit and tubing connecting each of the dispensing valves with the latter unit.

3,559,891
SPRAY GUN

Kurt Herman Liedberg, and Lars Gunnar Torbjorn Christensson, Skara, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden, a corporation of Sweden

Filed Apr. 15, 1969, Ser. No. 816,191
Claims priority, application Sweden, Apr. 19, 1968, 5,321/68
Int. Cl. B05b *7/00*
U.S. Cl. 239—443 **9 Claims**



In a spray gun with pressure fluid actuated servo motor for moving the coating material valve and with servopiston means in the servo motor to be pressurized for movement against or relieved for displacement by unidirectional force bias under the control of a control valve, a setting valve provides, when open, arresting of the servopiston means by pressure fluid in a position corresponding to closed position of the coating material valve irrespective of the position of the control valve. Such safety setting may be used for blowing live pressure fluid via the control valve to a blowing opening for blowing the workpiece clean preparatory to spraying.

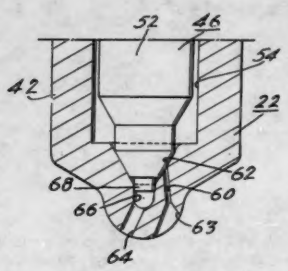
3,559,892
FUEL INJECTION NOZZLE WITH AUXILIARY SPRAY ORIFICE

Frank De Luca, Thompsonville, Conn., assignor to Ambac Industries, Inc., Springfield, Mass., a corporation of New York

Filed June 18, 1968, Ser. No. 737,888
Int. Cl. B05b *1/30*
U.S. Cl. 239—533 **1 Claim**

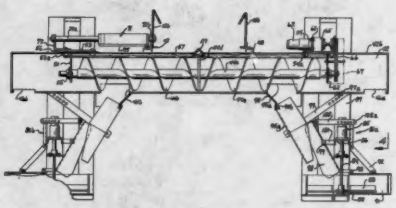
A fuel injection nozzle assembly comprising an elongated holder, a nozzle assembly having an axial bore mounted at

one axial end of the holder, a valve mounted in said axial bore in the nozzle, said nozzle including an elongated shank having a conical valve seat at its lower terminal end and a sac hole below the seat, said valve including a tip end in the closed position engaging the valve seat, said tip end including



a conical portion and a pintle adapted to engage in said sac hole in the nozzle, means defining a main fuel discharge orifice on the nozzle communicating at its inner end with the sac hole, means defining an auxiliary orifice of smaller cross section than said main orifice communicating at its inner end with said conical valve seat.

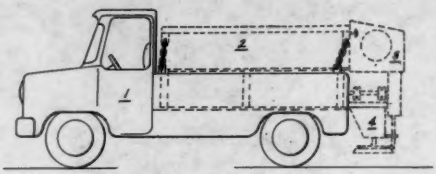
3,559,893
MATERIAL DISTRIBUTING APPARATUS
Victor H. Gruben, Rochelle, Ill., assignor to Swenson Spreader & Mfg. Co., Lindenwood, Ill., a corporation of Illinois
Filed May 21, 1969, Ser. No. 826,621
Int. Cl. A01c *17/00*
U.S. Cl. 239—664 **13 Claims**



A material-distributing apparatus for use on a vehicle having a material supply hopper, which material-distributing apparatus includes a cross conveyor having an intermediate inlet communicating with the supply hopper and first and second oppositely directed conveyor sections which are shiftable relative to the supply hopper, from a position feeding material from the inlet to relatively opposite sides of the vehicle, to shifted positions in which material is fed to only one or the other side of the vehicle. Spreaders are provided at each side of the vehicle for spreading material fed thereto by the cross conveyor and the spreaders are maintained in a fixed position while the conveyor is shifted.

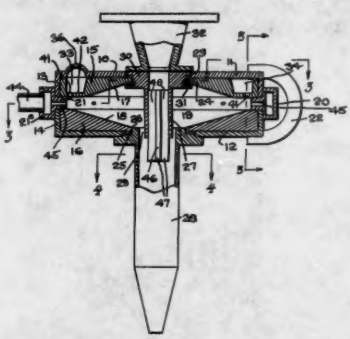
3,559,894
MATERIAL-SPREADING APPARATUS WITH INTERCHANGEABLE MATERIAL CONVEYOR ASSEMBLIES
Gregory J. Murray, and Frederick K. Tarrant, Sr., Saratoga Springs, N.Y., assignors to Tarrant Manufacturing Company, a corporation of New York
Filed Nov. 18, 1968, Ser. No. 776,321
Int. Cl. A01c *19/00*
U.S. Cl. 239—672 **11 Claims**

A material-spreading apparatus has a hopper consisting of a V-shaped upper section and a rectangular lower section having an opening at the bottom of its rear wall with guides in the bottom section so that a desired type of a plurality of material-conveying assemblies may be slid into or removed from the bottom section. A discharge chute at the end of a material-conveying assembly includes a spinner mechanism



and a plurality of internal deflectors to permit use with different types of conveyor assemblies. A palletized power unit for driving both the conveyor assembly and the spinner is attached to the rear wall of the hopper and is removable to facilitate maintenance.

3,559,895
APPARATUS FOR AND METHOD OF COMMINUTING SOLID MATERIALS
Edwin F. Fay, West Centennial Drive, Marlton, N.J. 08053
Filed Feb. 20, 1968, Ser. No. 706,880
Int. Cl. B02c *19/06*
U.S. Cl. 241—5 **10 Claims**

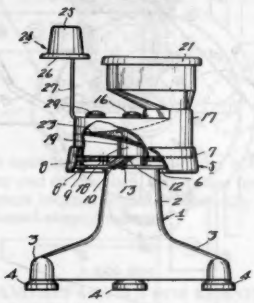


A fluid energy mill for pulverizing to finely comminuted state dry solid material the particles of which are injected into a grinding chamber for entrainment in a high velocity vortex of a gaseous grinding fluid established in said chamber. The particles to be pulverized and the primary grinding fluid are conjointly introduced into the grinding chamber in the form of feed jets of the material and grinding jets of the fluid relatively so arranged as to locate each feed jet in such close downstream proximity and so oriented with respect to an associated grinding stream that each pair of the associated jets serves as an individual grinding unit to insure the desired reduction in size of the particles serviced by said unit before they are permitted to be discharged from the mill. The discharge outlet of the mill, which may be provided with one or more of the above-mentioned grinding units or of any conventional form, is internally fitted with a spider having exposed directional vanes for minimizing pressure drop at the intake end of the outlet and correspondingly increasing the vortical velocity of and the available energy in the gaseous energy fluid stream present in the grinding chamber of the mill.

3,559,896
MATERIAL CHIPPING MACHINE
Eiichi Sugiyama, 3, 2-chome, Shintomi-cho, Shizuoka, Japan
Filed Oct. 19, 1967, Ser. No. 676,415
Int. Cl. B02c *19/20*
U.S. Cl. 241—95 **12 Claims**

A material chipping machine suitably employed for chipping ice blocks comprising base support means; material

supporting and chipping means fixedly mounted on said base support means; a rotary drum member rotationally received in said material supporting and chipping means for rotational movement relative to said material supporting and chipping



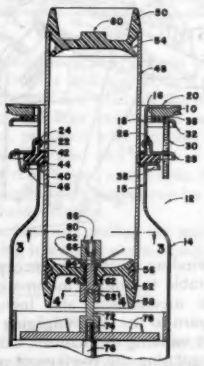
means; an arcuate material guiding and holddown conduit integrally formed with said drum member for rotational movement together with the latter; a hopper removably received in said drum member; and a handle connected to said arcuate material guiding and holddown conduit.

3,559,897

BLENDER MIXER ATTACHMENTS FOR USE WITH HOUSEHOLD GARBAGE DISPOSER UNITS

Ben W. Carr, 274 Hillsmere Drive, Annapolis, Md. 21403

Filed Mar. 12, 1969, Ser. No. 815,242
Int. Cl. B01f 7/16
U.S. Cl. 241—101 11 Claims



A blender mixer attachment adapted to be drivingly connected through a sink drain opening to the rotor of a household garbage disposal unit, including novel support means for the blender container to resist lateral and vertical movement when the blender is in its position of use.

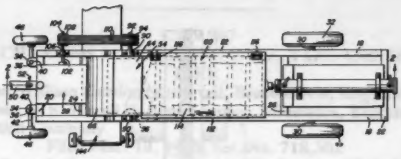
3,559,898

WOOD-CHIPPING MACHINE

Joseph P. Rinke, Bellwood, Nebr. 68624

Filed Oct. 8, 1968, Ser. No. 765,752
Int. Cl. B27l 11/02
U.S. Cl. 241—101 5 Claims

A mobile device into which portions of a tree may be inserted to be rendered down into wood chips to be used for mulching, litter, and other uses. A hydraulic ram forces the tree portions into engagement with a cylindrical drum with



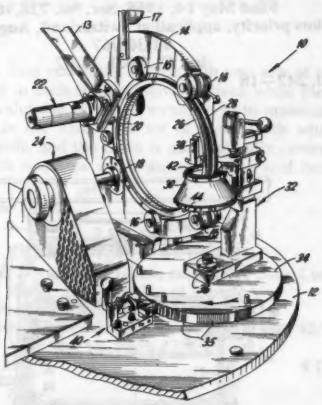
knife edges attached thereto which renders the tree portion advancing thereon into chips.

3,559,899

TOROIDAL COIL-WINDING MACHINE FOR DEFLECTION YOKE COILS FOR TELEVISION PICTURE TUBES AND THE LIKE

Rudolf Fahrbach, Branchville, N.J., assignor to Universal Manufacturing Company Inc., Irvington, N.J., a corporation of New Jersey

Filed Feb. 24, 1969, Ser. No. 801,255
Int. Cl. H01f 41/08
U.S. Cl. 242—4 5 Claims



A machine for winding toroidal coils useful for yokes of television picture tubes having an air motor for loading the magazine and for winding the coil under uniform tension. An indexing mechanism comprising an index plate under control of a double-throw pawl effects precisely located winding turns on the inner face of the toroidal yoke core facing the outer surface of the television picture tube. The index plate of the indexing means is arranged for a plurality of different winding configurations and in combination with the double-throw pawl winding assures accurate and precise winding without damage to the teeth of the index plate.

3,559,900

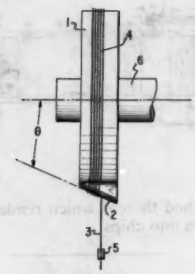
FIBER-ALIGNING DEVICE

Yuho Harada, and Kenzo Hiramatsu, Omiya-shi, Japan, assignors to Fuij Photo Optical Co. Ltd., Omiya-shi, Japan

Filed Mar. 4, 1969, Ser. No. 804,174
Claims priority, application Japan, Mar. 6, 1968, 43/14,430
Int. Cl. B65h 54/02, 75/18
U.S. Cl. 242—18 6 Claims

An alignment device used during the winding of optical fibers on a takeup drum, a portion of the periphery of the

takeup drum is arranged to form an inclined plane or surface which angles inwardly towards the axis of rotation of the



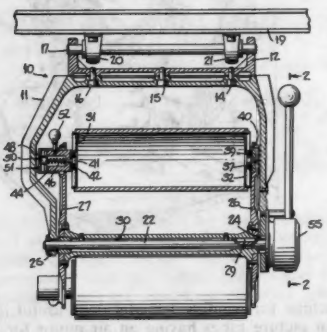
drum. The inclined surface provides arrangement of the individual fiber windings into aligned engagement with adjacent fibers arranged on the periphery of the drum.

3,559,901

SEMIAUTOMATIC BOBBIN CHANGER

Max Schnetzer, and Helmut Ritter, Wattwil, Switzerland, assignors to Heberlein Patent Corporation, New York, N.Y., a corporation of New York

Filed May 14, 1968, Ser. No. 728,966
Claims priority, application Switzerland, Aug. 11, 1967, 11,368/67
Int. Cl. B65h *54/02*
U.S. Cl. 242—18 **11 Claims**



Bobbin changer mechanism having a bobbin holder which frictionally engages a plurality of bobbins and having a bobbin-switching mechanism which provides dampening and sliding coupling between the bobbin changer and its support.

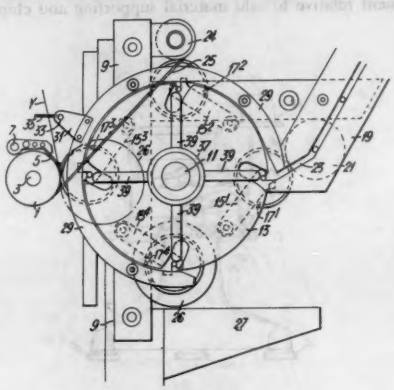
3,559,902

CONTINUOUS WINDING OF YARNS

James Brock, Pontypool, England, assignor to Imperial Chemical Industries Limited

Filed Aug. 23, 1968, Ser. No. 754,779
Claims priority, application Great Britain, Sept. 5, 1967, 40,456/67
Int. Cl. B65h *54/42, 67/04*
U.S. Cl. 242—18 **5 Claims**

Apparatus for automatically supplying empty bobbins to a windup position and for carrying a woundup bobbin to a discharge position. The apparatus comprises a rotatable cage having a plurality of bobbin-receiving means and which cage is indexed so as to carry a bobbin from one position or sta-



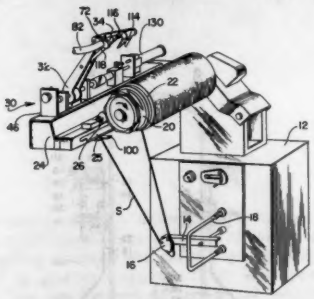
tion to yarn-winding-up position and thence to the discharge position. Conveniently the apparatus consists of a series of cages mounted for rotation on a common shaft.

3,559,903

HIGH SPEED WINDING MACHINE

Richard B. Mc Dermott, and Hans H. Richter, Warwick, R.I., assignors to Leesona Corporation, Warwick, R.I., a corporation of Massachusetts

Filed Apr. 16, 1969, Ser. No. 816,514
Int. Cl. B65h *54/02*
U.S. Cl. 242—18 **12 Claims**



High speed winding mechanism incorporating yarn engaging means operable to engage automatically the yarn to be wound on the mechanism, and including structure for delivering the yarn to the yarn engaging means from a locus remote from the winding mechanism. Control means are also included for regulating the movement of the yarn onto the winding zone of the winding mechanism after seizure of the yarn by the yarn engaging means. The mechanism may also include further control means for forming a transfer tail on the package of yarn to be wound.

3,559,904

DEVICE FOR REMOVING THE STARTING END OF A COIL-WOUND TEXTILE YARN FROM THE BORE OF A CORE ON WHICH THE COIL IS WOUND

Hans Raasch, Rheydt, Germany, assignor to Walter Reiners, Moenchengladbach, Germany

Filed Mar. 14, 1969, Ser. No. 807,366
Claims priority, application Germany, Mar. 16, 1968, 1,710,133
Int. Cl. B65h *54/22*
U.S. Cl. 242—35.6 **7 Claims**

Device for removing the starting end of a coil-wound textile yarn from the bore of a core on which the coil is wound

includes suction tube means having an opening alignable with the bore of a coil core at one end of the core, a funnel-shaped member having a downwardly tapering end portion and an outwardly flaring end, the outwardly flaring end being

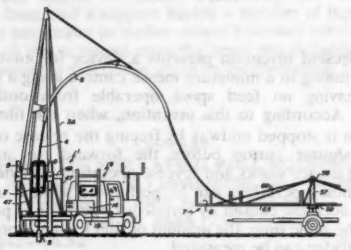
formed with an opening alignable with the bore of the coil core at the other end of the core, and means for producing a whirling air current located in the downwardly tapering end portion of the funnel-shaped member.

3,559,905

METHOD AND APPARATUS FOR RUNNING AND PULLING A CONTINUOUS METAL MEMBER INTO AND OUT OF A WELL

Alexander Palynchuk, Edmonton, Alberta, Canada, assignor to Corod Manufacturing, Ltd., Edmonton, Alberta, Canada, a corporation of Province of Alberta

Filed Jan 9, 1968, Ser. No. 697,287
Int. Cl. B65h *75/00*
U.S. Cl. 242—54 **5 Claims**



Apparatus is provided which pulls a metal member, such as a sucker rod string, from a well and coils it onto a circular frame which is of sufficient size whereby the member will not be permanently deformed. For example, a pair of opposed, driven, endless tracks, provided with gripping pads, grip the member between the pads and pull it out of the well. The member is fed to and reeled onto a rotatable, horizontal, circular channel for storage. The channel can be collapsed into a compact form for transportation.

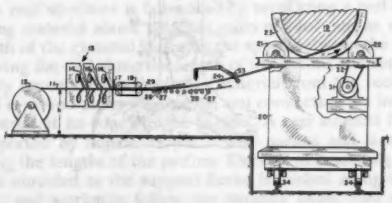
The steps of the method are: pulling the member from the well; coiling and storing it without permanently deforming it; and running it back into the well.

3,559,906

CABLE CORE TAKEUP APPARATUS

Frederic B. Krafft, Hastings-On-Hudson, N.Y., and George N. Menasoff, Fort Lauderdale, Fla., assignors to Anaconda Wire and Cable Company, a corporation of Delaware

Filed Nov. 27, 1968, Ser. No. 779,449
Int. Cl. B65h *75/00*
U.S. Cl. 242—54 **4 Claims**



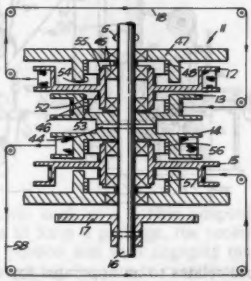
Apparatus for reeling heavy cable cores at a taping machine has the reel elevated so that the core is taken up from beneath the reel and is free from reverse bending. The taping machine capstan pays the core onto a horizontal roller stand that supports the lower end of the catenary from the reel.

3,559,907

MECHANISMS FOR REELING WIRE, TAPE AND THE LIKE

Roland William Gordon Somervell, Beaconsfield, England, assignor to S. Davall & Sons Limited, Middlesex, England, a British Company

Filed Mar. 18, 1968, Ser. No. 718,302
Claims priority, application Great Britain, Apr. 28, 1967, 19690/67
Int. Cl. G11b *15/32*; **B65h** *25/32*, *54/78*
U.S. Cl. 242—54.1 **13 Claims**



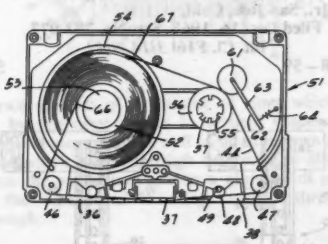
A magnetic wire recording device with two sets of coaxial reels. One reel in each set is positively driven while the other is driven via a slipable clutch so arranged as to maintain constant tension in the wire. One set of reels winds while the other set rewinds, and the drive is automatically reversed by a switch which operates when an unwinding reel becomes empty.

3,559,908

ENDLESS TAPE CARTRIDGE

Hanjiro Esashi, Miyagi-ken, Japan, assignor to Sony Corporation, Tokyo, Japan, a corporation of Japan

Filed Dec. 18, 1967, Ser. No. 691,324
Claims priority, application Japan, Dec. 30, 1966, 42/209
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 **9 Claims**



An endless tape cartridge for magnetic recording and reproducing, including first and second hubs rotatably mounted in a cartridge, and an endless tape wound on the first hub. The second hub may be selectively driven to move the endless tape forward fast. The tape is driven with a normal capstan and pinch roller during normal use but the second hub is utilized to move the endless tape forward when the tape is to be moved to a new position in a fast manner. In one modification a pinch roller engages the tape and presses it against the second hub and in a second modification the frictional engagement of the tape with the second hub moves it forward.

3,559,909

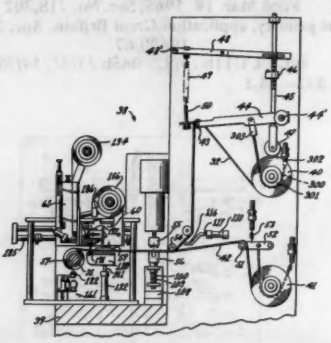
STRIP CONDUCTOR COIL MAKING APPARATUS OR THE LIKE

Benton A. Whiteman, Richmond, and Robert B. Lightner, Henrico County, Va., assignors to Reynolds Metals Company, Richmond, Va., a corporation of Delaware

Original application Oct. 18, 1965, Ser. No. 497,069, now Patent No. 3,412,450. Divided and this application June 24, 1968, Ser. No. 753,331

Int. Cl. B65h *39/16, 25/28*

U.S. Cl. 242—56.1 9 Claims



This disclosure relates to an apparatus for winding a strip of conductive material into a plurality of strip conductor coils at a predetermined location in the apparatus while securing two leads in side-by-side relation to the strip of conductive material in advance of the coil making location so that the strip can be separated between the two leads in order that one of the leads can form the outer lead on the coil being wound at the predetermined location and the other lead will form the inner lead on a subsequent coil that will be wound by the apparatus, the apparatus having a movable carriage carrying a pair of movable taping heads so that one of the taping heads can attach a length of tape to one end of the strip of conductive material and tape the same to a core on which the strip will be subsequently drawn and wound into coil form and the other taping head being utilized to secure the outer end of the strip of conductive material onto the coil being formed therefrom.

3,559,910

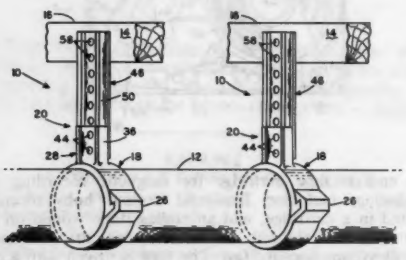
PLASTIC PIPE HANGER

Billy W. Babb, Campbell, Calif., assignor to Robert R. Walker, Jr., San Jose, Calif.

Filed Dec. 16, 1968, Ser. No. 783,977

Int. Cl. F16l *3/14, 9/12*

U.S. Cl. 248—59 5 Claims



A hanger for a pipe constructed of a collar formed with an interstice and being bendable between a pipe-engaging position and a pipe-releasing position. The collar is provided with interlocking members for releasably securing the collar in pipe-engaging position and means are provided for suspending the collar from a supporting structure.

3,559,911

FORWARD-REVERSE RUN AUTOMATIC STOP DEVICE FOR FILM REWIND DEVICE OF MINIATURE MOVIE CAMERA

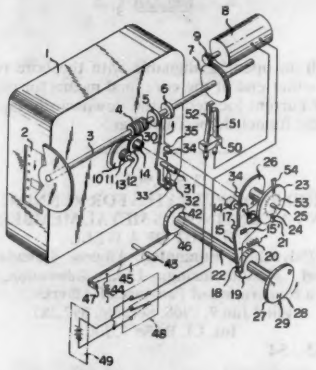
Yoshihisa Katsuyama, Yokohama-shi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan, a corporation of Japan

Filed Feb. 19, 1969, Ser. No. 800,613

Claims priority, application Japan, Feb. 23, 1968, 43-11128

Int. Cl. G03b *1/06*

U.S. Cl. 242—71.5 2 Claims



The present invention presents a device for enabling the film rewinding in a miniature movie camera using a film cartridge having no feed spool operable from outside the camera. According to this invention, when the film in forward run is stopped midway by freeing the release operation of the shutter button before the forward run automatic stopping device works and reverse operation is made successively, these operations can be performed without any trouble. An accident caused by erroneous operation is prevented and at the same time, the amount of film loosely stored in the film cartridge can be measured.

3,559,912

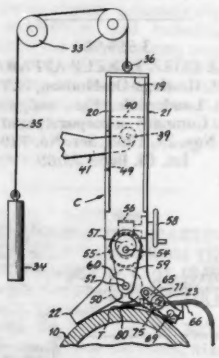
METHOD AND APPARATUS FOR MOUNTING A NEGATIVE

Vernon J. Herzing, and Ingvar L. Tolf, Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y., a corporation of Delaware

Filed Aug. 2, 1968, Ser. No. 749,811

Int. Cl. B65h *75/28*

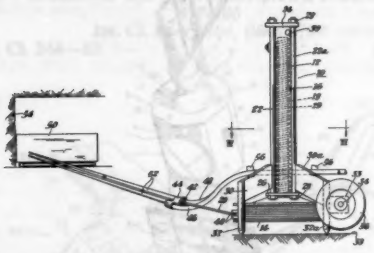
U.S. Cl. 242—74 15 Claims



A negative is correctly aligned relatively to a roll or cylinder on which it is to be mounted, by utilizing a cradle so

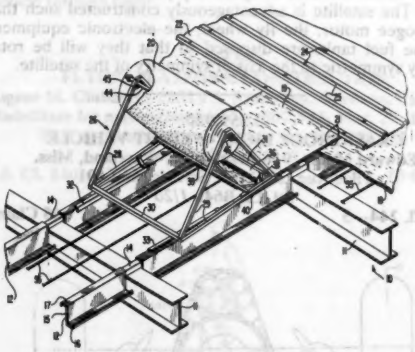
constructed that when it rests on the roll, it is inherently aligned with its longitudinal axis parallel to the axis of rotation of the roll. By first properly relating the negative to the cradle, and then applying the cradle to a roll, the negative is effectively aligned relatively to the roll and may be wrapped about the roll.

3,559,913
LEADS TENDER
Michael Hajduk, R.D. 1, Fayette City, Pa. 15438
Filed Aug. 12, 1968, Ser. No. 751,842
Int. Cl. B65h *17/46*
U.S. Cl. 242—86.5 11 Claims



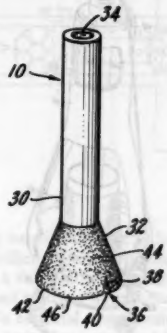
The leads tender comprises a rotatably and biasingly mounted drum and a support having a number of legs. Each of the legs terminates in anchor means extended outwardly of the drum. A line is wound upon the drum and includes means for attachment to external leads of an independently movable apparatus.

3,559,914
APPARATUS FOR LAYING ROLL ROOFING
Robert J. Alderman, Rte. 4, Lawrenceville, Ga. 30245
Filed Sept. 2, 1969, Ser. No. 854,511
Int. Cl. B65h *17/46*
U.S. Cl. 242—86.52 9 Claims



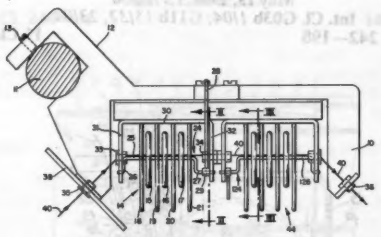
A roof structure is fabricated by supporting a reel of insulating material above adjacent pairs of roof purlins with the width of the material spanning the space between the purlins, moving the reel along the length of the purlins and simultaneously unreeling the insulating material from the reel as the reel is moved along the purlins, and connecting the insulating material at its edges to the purlins. A reel support frame is supported by adjacent ones of the purlins and is movable along the lengths of the purlins. The reel of insulating material is unreeled as the support frame is pushed along the purlins, and workmen follow the support frame and connect hard roofing material to the purlins to complete the roof structure.

3,559,915
BOBBIN FOR A TEXTILE MACHINE
Charles C. Bell, Warwick, and Kurt W. Niederer, Saunderstown, R.I., assignors to Leesona Corporation, Warwick, R.I., a corporation of Massachusetts
Filed May 13, 1968, Ser. No. 728,637
Int. Cl. B65h *75/18*; D01h *9/08*
U.S. Cl. 242—118.3 11 Claims



A yarn receiver such as a bobbin adapted to have yarn wound thereon to form a package, the receiver including a yarn receiving portion and yarn engaging means associated therewith for engaging the yarn to commence its winding on the receiver.

3,559,916
THREAD TENSIONER
Max Hilscher, 21 Bottingerstrasse, 7901 Tomerdingen, Germany
Filed Aug. 9, 1968, Ser. No. 751,476
Int. Cl. B65h *59/12*
U.S. Cl. 242—154 6 Claims

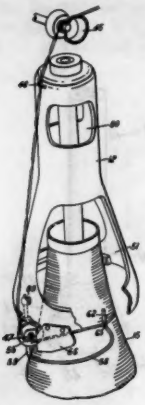


A device consists of a plurality of rings which are constrained by separator means in vertical spaces permitting limited lateral movement as well as up and down movement, and a rod which passes through the rings. In alternate embodiments the rod is movable to a plurality of positions to control the contact of the rings with a thread passing therethrough.

3,559,917
WOUND PACKAGE
John Kay Pringle Mackie, Belfast, Northern Ireland, assignor to James Mackie & Sons Limited, Albert Foundry, Belfast, Northern Ireland, a British company
Original application Sept. 5, 1967, Ser. No. 665,615, now Patent No. 3,449,901. Divided and this application Dec. 13, 1968, Ser. No. 795,765
Int. Cl. B65h *55/00*
U.S. Cl. 242—159 6 Claims

Synthetic plastic tape drawn from a controlled speed supply source is wound on a nonrotary support by means of

mechanism comprising a winding guide for the tape which is driven round the axis of the support, while a relative axial traversing motion takes place between the guide and the support, so as to apply one turn of twist for each revolution of



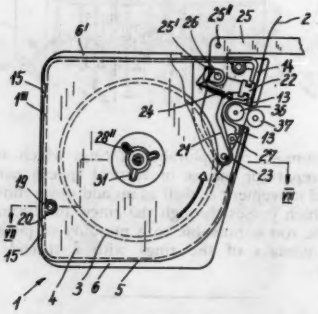
the guide. The tape is fed to the winding guide in a generally axial direction from a letoff guide and at a tension such that the twist is applied in a controlled manner represented by localized folds to give a package from which the tape can be unwound overend in a twist-free condition.

3,559,918

FILM PROJECTOR

Carl Braun, 8500 Nurnenberg, Germany (c/o Carl Braun Camera-Werk, Muggenhofer Strasse 122, Germany)

Filed Sept. 26, 1968, Ser. No. 762,837
Claims priority, application Germany, Oct. 3, 1967, 1,597,122; May 15, 1968, 1,772,436
Int. Cl. G03b *1/04*; G11b *15/32*, *23/04*
U.S. Cl. 242—198 11 Claims



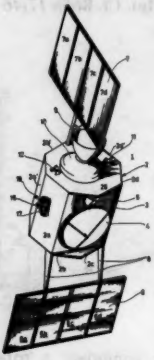
A boxlike film cartridge for use in projectors and having a tangentially arranged film exit opening. The cartridge is arranged to be carried on a pivoting door of the projector housing and carries a film clamping means which is arranged to clamp the film when the motor is automatically switched off by the end of the film passing through the picture gate at the end of rewind, in advance of cessation of rotation of the motor, so as to prevent the film being withdrawn entirely into the cartridge.

3,559,919

ACTIVE COMMUNICATION SATELLITE

Hans Eckhard Sass, Munich, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Ottorbrunn, Munich, Germany

Filed June 5, 1968, Ser. No. 734,596
Claims priority, application Germany, June 22, 1967, 1,506,648
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 11 Claims



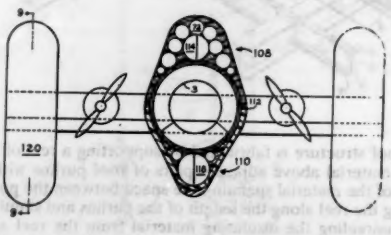
An active communications satellite which is stabilized as to attitude and to orbit includes at least one directional antenna rigidly mounted on a body portion. The antenna part of the generated surface of the body of the satellite in the operating condition is oriented toward earth. The other parts of the surface of the body are penetrated by control engines and their connecting parts which serve to control the attitude and orbit stabilization of the satellite. Some of the control engines are enclosed in the operative condition of the satellite by at least two unfoldable solar battery areas which are mounted on pivot arm members to permit them to be swung outwardly when the satellite is in space. A fly wheel is carried by the body for the attitude stabilization of the satellite and it rotates about the axis of symmetry parallel to the antenna plane. The satellite is advantageously constructed such that the apogee motor, the fly wheel, the electronic equipment and the fuel tanks are disposed so that they will be rotationally symmetric to the axis of symmetry of the satellite.

3,559,920

CRASHPROOF LIGHT-WEIGHT VEHICLE

Alvin Edward Moore, 916 Beach Blvd, Waveland, Miss.

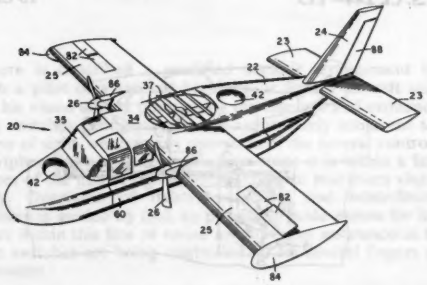
Filed Aug. 22, 1967, Ser. No. 662,401
Int. Cl. B64b *1/20*
U.S. Cl. 244—5 65 Claims



A lightweight, wreckproof, flying boat, airship, or other vehicle adapted to traverse water or land, comprising: a strong, barrel-curved cabin; and around it a shock-taking shield of foam plastic containing numerous lift-providing balloons. Preferably the vehicle is slightly heavier than air and also has other lift-providing means - for example fluidfoil

means (a short wing and hydrofoil). It has means for landing on water, ice or other solid surface. The barrel-curved cabin wall may be made of solid wood or inflated stavelike elements, or laminated plywood, or wire mesh that is coated and impregnated with plastic. The vehicle, which also comprises a stern structure having shock-absorbing plastic and balloons, is generally shaped in airship fashion, or else as a large flying wing.

3,559,921
STANDING TAKE-OFF AND LANDING VEHICLE (A GEM/STOL VEHICLE)
Eugene L. Timperman, 5565 Fox Road, Cincinnati, Ohio
Continuation of application Ser. No. 629,581, Apr. 10, 1967, now abandoned. This application Apr. 24, 1969, Ser. No. 825,105
Int. Cl. B64c *1/04*; B60v *3/08*
U.S. Cl. 244—12 **15 Claims**

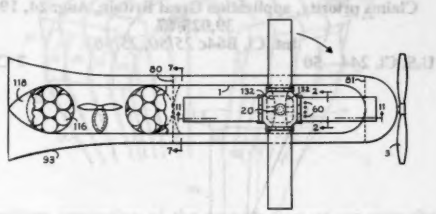


An aerodynamic vehicle having a peripheral jet ground effects machine system incorporated within the fuselage of the vehicle by which it can take off and land from a standing position either on land or on sea. An impeller or axial flow fan provides for generation of power required to assist the vehicle into a stable aerodynamic hovering condition after which conventional or other known power sources propel the vehicle through flight.

3,559,922
FLYING PLATFORM CONSTRUCTION
Eugene M. Gluhareff, 18518 S. Broadway, Gardena, Calif.
Substitute for application Ser. No. 802,333, Mar. 27, 1959. This application Nov. 1, 1967, Ser. No. 718,641
Int. Cl. B64c *27/18*
U.S. Cl. 244—17.17 **13 Claims**

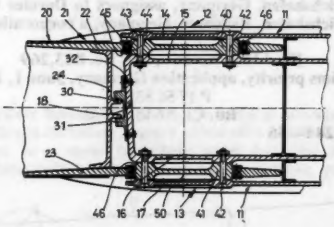
A flying platform type of helicopter. A generally vertical, nonrotating main shaft has the platform affixed to its upper end and a landing gear attached to its lower end. A rotor member is rotatably mounted on the fixed shaft and is driven by one or more jet engines mounted thereon. A circular rotating fuel tank is mounted on the fixed shaft generally coaxially thereof.

3,559,923
CRASH-RESISTANT HELICOPTER
Alvin Edward Moore, 916 Beach Blvd., Waveland, Miss.
Filed May 6, 1969, Ser. No. 822,199
Int. Cl. B64c *11/24*, *1/00*
U.S. Cl. 244—17.11 **39 Claims**



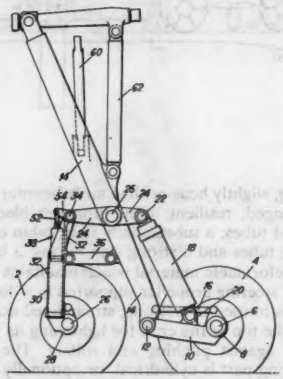
A strong, slightly heavier than air helicopter or like vehicle having: hinged, resilient lifting-propeller blades comprising gas-inflated tubes; a substantially rigid cabin comprising gas-containing tubes and a strong skin means; a landing cushion of easily deformable material which maintains its outer shape in flight; a steering propeller supported in a doughnut-shaped tube that is housed in a strong, streamlined skin; and balloon means at the top of the craft for lightening its weight and stabilizing it against pitching and rolling. The cabin's main, load-carrying part is cylindrical, or optionally oblong or barrel-shaped; and optionally its tubular members are in stavelike elements having strong, planar sides that are epoxy-glued together.

3,559,924
MOUNTING ASSEMBLY FOR AN ADJUSTABLE SWEPTBACK AIRCRAFT WING
Hans Jochner, Munich, Germany, assignor to Entwicklungsring Sud GmbH, Munich, Germany
Filed July 1, 1968, Ser. No. 743,913
Claims priority, application Germany, July 5, 1967, E34,317;E34,318
Int. Cl. B64c *3/40*
U.S. Cl. 244—46 **14 Claims**



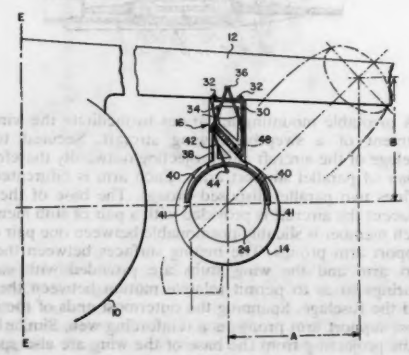
A pivotable mounting apparatus to facilitate the wing adjustment of a sweptback wing aircraft. Secured to the fuselage of the aircraft and projecting outwardly therefrom is a pair of parallel support arms. Each arm is bifurcated and defines two parallel disposed prongs. The base of the wing adjacent the aircraft is provided with a pair of stub members. Each member is slidably positionable between one pair of the support arm prongs. The mating surfaces between the support arm and the wing stubs are provided with suitable bearings so as to permit relative motion between the wing and the fuselage. Spanning the outermost ends of the innermost support arm prongs is a reinforcing web. Similarly, the stubs projecting from the base of the wing are also spanned by a reinforcing web. Secured to the support arm web and the wing stub reinforcing web is a bearing means which serves to absorb the axial thrust created by the wing during flight.

3,559,925
UNDERCARRIAGES
Francis Joseph Costigan, Henlow, and Charles William May, St. Albans, England, assignors to Hawker Siddeley Dynamics Limited, Hatfield, Hertfordshire, England, a British Company
Filed Aug. 20, 1968, Ser. No. 754,000
Claims priority, application Great Britain, Aug. 24, 1967, 39,028/67
Int. Cl. B64c *25/50, 25/58*
U.S. Cl. 244—50 7 Claims



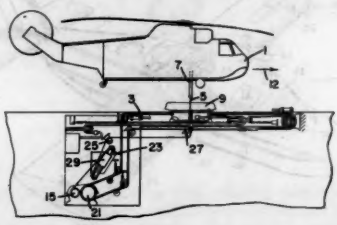
In main undercarriage gear for an aircraft, in which the wheels are in two pairs in tandem, one pair being forward of the lower end of the main undercarriage strut and the other pair being rearward, a configuration is provided to enable either one, or both, pairs of wheels to castor when the aircraft is taxiing so as to avoid tyre scrub. The pair of wheels which is to castor is mounted in trailing configuration on the subsidiary leg which is itself carried on the main strut by means of a parallel linkage so that it can rise and fall with respect to the main strut. The wheel pair castors about the vertical axis of this subsidiary leg.

3,559,926
VTOL AIRCRAFT
Werner Fruehauf, Ailingen, and Heinz Guenter, Friedrichshafen, Germany, assignors to Dornier G.m.b.H., Friedrichshafen, Badensee, Germany, a corporation of Germany
Filed May 9, 1969, Ser. No. 823,269
Claims priority, application Germany, June 1, 1968, P 17 56 532.1
Int. Cl. B64d *29/00*
U.S. Cl. 244—56 23 Claims



A VTOL aircraft has at least one engine supported on each side of the longitudinal central axis of the aircraft, each of these engines being supported for pivotal movement about an axis extending obliquely downwardly and away from the fuselage so that the engine means pivots from a normal operating position to a takeoff and landing position wherein the air intake of the engine means is disposed a greater distance from the longitudinal central plane of the aircraft and at a greater vertical elevation. Jet discharge means on each of the engine means includes movable parts which move so that in the takeoff and landing position of the engines the jet discharge is directed downwardly in a substantially vertical direction.

3,559,927
HELICOPTER RAPID SECURING DEVICE
Asbjorn Baekken, Dartmouth, Nova Scotia, Canada, assignor to Fairey Canada Ltd., Dartmouth, Nova Scotia, Canada, a corporation of Canada
Filed Mar. 11, 1969, Ser. No. 806,212
Claims priority, application Canada, Aug. 21, 1968, 28,072
Int. Cl. B64f *1/12*
U.S. Cl. 244—115 13 Claims

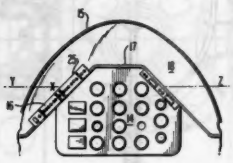


An improved probe for mounting on the underside of a helicopter, to be used when landing on the deck of a ship. The ship would be provided with a trap device which grasps the probe and holds it and the helicopter immediately touches down. The improved probe is telescopic and has a compression spring at its upper end biassing it downwardly. Below the spring is provided a latch which locks to the probe a haul-down cable extending from the helicopter to the ship.

3,559,928
AVIATION WINDSHIELD PROTECTIVE DEVICE
Elroy Dohmeyer, 11242 N. Cedarburg Road, Mequon, Wis.
Filed July 22, 1969, Ser. No. 843,512
Int. Cl. B64c *1/14*
U.S. Cl. 244—121 2 Claims

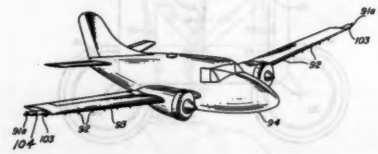
A plurality of sheet transparencies covering a portion of an airplane windshield and means for successively divesting each sheet element beginning with the outermost.

3,559,929
ORDNANCE ACTUATION CONTROLS WITHIN THE RANGE OF VISION OF A PILOT LOOKING FORWARD FROM A COCKPIT
David B. Lindsay, Jr., Box 1719, Sarasota, Fla. 33578
Filed June 10, 1969, Ser. No. 831,962
Int. Cl. B64d 47/00
U.S. Cl. 244—129 10 Claims



There is described a modified cockpit arrangement by which a pilot of a tactical bombing or fighter aircraft sees both his visual aiming point along the fuselage and ordnance firing switches contiguous to, and immediately subjacent to, his line of sight, wherein any operation of the several controls is peripherally seen for identification since it is within a few degrees of the line of sight corresponding to maximum visual acuity. Operation of master switching and subordinate switching is guided by feel, by providing guide means for his fingers within this line of vision as additional assurance as to which switches are being controlled by his several fingers at any instant.

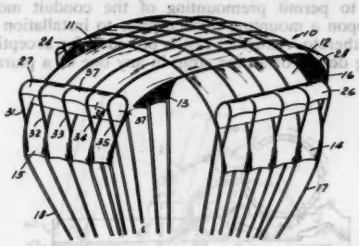
3,559,930
DISTRIBUTION OF PARTICULATE MATERIAL
Archibald B. Sellards, 6928 E. Coronado Road, Scottsdale, Ariz. 85257
Filed Dec. 9, 1968, Ser. No. 786,812
Int. Cl. B64d 1/16
U.S. Cl. 244—136 2 Claims



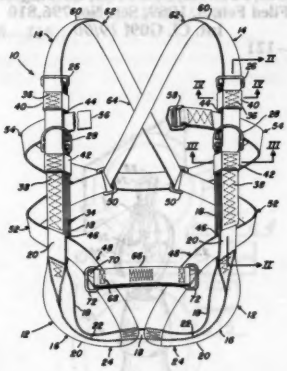
An improved particulate material handling and application system for use in combination with an aircraft including a material hopper carried by the fuselage, ducts for distributing the material extending longitudinally of the airfoils and positive displacement transfer mechanism for delivering the particulate material from the hopper to the distribution duct system. Means are provided for removing remnant or excess particulate material from the outboard ends of the distribution ducts.

3,559,931
STABILITY DEVICE FOR PARACHUTES
Russell A. Pohl, Sioux Falls, S. Dak., assignor to Raven Industries, Inc., S. Dak., a corporation of South Dakota
Filed July 23, 1968, Ser. No. 746,806
Int. Cl. B64d 17/14
U.S. Cl. 244—145 13 Claims

An improved parachute which has a burble fence attached to the outer portion of the canopy in order to cause separation of the air flowing over the outer surface of the canopy at the same location at all times. This eliminates oscillations which are caused with conventional parachutes due to the nonuniform separation of the smooth flow of air over the canopy.



3,559,932
INTEGRATED PARACHUTE HARNESS FOR SUPPORTING A RESERVE PARACHUTE SYSTEM
Mathais N. Ternes, El Centro, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed Feb. 20, 1969, Ser. No. 801,056
Int. Cl. B64d 17/30
U.S. Cl. 244—151 6 Claims



A parachute harness which has an integral arrangement of webbing straps including a quick releasable means to support the wearer to a main parachute pack and also including quickly detachable means to secure a reserve parachute pack.

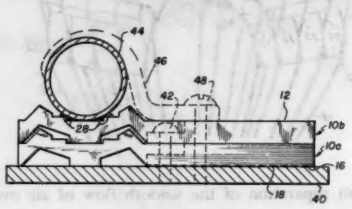
ERRATUM

For Class 248—59 see:
Patent No. 3,559,910

3,559,933
CONDUIT MOUNTING DEVICE
Edward J. Castellani, South Plainfield, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J., a corporation of New Jersey
Filed Feb. 28, 1969, Ser. No. 803,275
Int. Cl. F16l 3/10
U.S. Cl. 248—74 8 Claims

The invention is directed to a conduit mounting device for mounting a conduit upon a mounting surface. The conduit mounting device consists of a base portion terminating in a nest portion. The upper surface of the nest portion is formed in order to accept conduits of varying diameters while the

lower surface of the nest portion is undercut so that a plurality of similar conduit mounting devices may be stacked one atop the other. A keyhole slot is provided within the base portion to permit premounting of the conduit mounting device upon a mounting surface prior to installation of the conduit thereto. A further slot is provided for accepting the fastening device of a pipe strap in any one of a plurality of



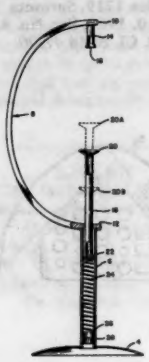
positions along the length of the slot. A scale is provided on the base member adjacent the slot to facilitate the positioning of a pipe strap fastening device to accommodate varying diameters of conduit. An adhesive backing may be provided on the base portion to permit mounting of the device upon a mounting surface without the necessity for additional fastening devices.

3,559,934
UNIVERSAL HOLDER
Venita R. Jensen, 9110 Rayford Drive, Los Angeles, Calif.
Filed Feb. 5, 1969, Ser. No. 796,810
Int. Cl. G09f *19/00*
U.S. Cl. 248—121 **6 Claims**

This invention relates to holders and more particularly to those adapted to be used as card or menu holders. It comprises essentially a stand with a ring affixed thereon, and a swivel clip slidably engaged with said ring and movable universally about said ring for retaining cards, menus and the like in any desired position. This device is an ideal holder for memos and notes.

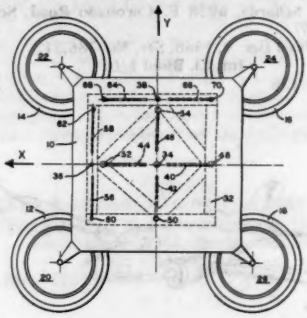
3,559,935
HOLDER FOR ART OBJECT
Joan P. Gardner, 2637 Buchanan St., San Francisco, Calif.
Filed May 7, 1969, Ser. No. 822,464
Int. Cl. A47f *5/00*
U.S. Cl. 248—125 **1 Claim**

A holder for an art object is provided including a stand with an arcuate member on the top thereof with a cupped holder downwardly extending from the top of the arcuate member and an adjustable bottom holder extending upwardly from the stand. The bottom holder is spring mounted and tension on the spring can be adjusted by means of an adjust-



ing stud so that objects of various sizes and weights can be easily supported.

3,559,936
MOTION SIMULATOR
Andre J. Guyon, Binghamton, N.Y., assignor to Singer-General Precision, Inc., Binghamton, N.Y., a corporation of Delaware
Filed Nov. 26, 1968, Ser. No. 779,032
Int. Cl. G09b *9/08*
U.S. Cl. 248—179 **4 Claims**

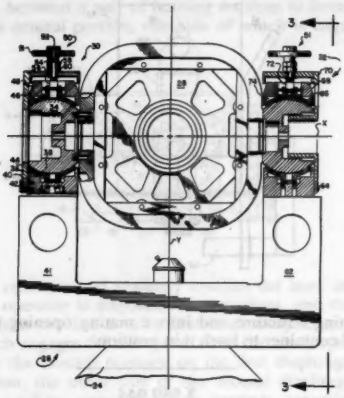


A motion simulator having mechanical actuators for moving a platform, or the like, in a controlled manner within specified limits and including fluid means arranged to exert a buoyant force opposing the gravity vector of the platform and equipment mounted thereon. In the disclosed embodiment, the buoyant means comprise a plurality of floats immersed in a liquid and connected to the motion platform by means of rigid links connected at opposite ends by means of suitable joints to the floats and platform.

3,559,937
OPTICAL TRACKING MOUNT
T.O. Paine, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of; Roy Broussard, and Josef M. Beehm, Huntsville, Ala.
Filed Sept. 26, 1968, Ser. No. 762,956
Int. Cl. F16c *17/16*
U.S. Cl. 248—183 **4 Claims**

A tracking mount for a laser telescope having a rotatable base, a yoke mounted on the base and a bracket mounted for rotation in the yoke. The bracket mounts the telescope and is supported in the yoke by two spherical air bearings. Each air

bearing includes a spherical journal attached to the mounting bracket and upper and lower spherical bearing members in which the journal rotates. The bearing members of one air



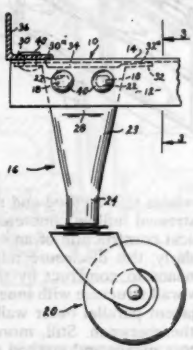
bearing are fixed to the yoke and the bearing members of the other air bearing are moveably mounted on the yoke by a flexure joint.

3,559,938

LEG FOR SUPPORTING A FURNITURE FRAMEWORK

Allan E. Harris, Winnetka, Ill., assignor to Harris-Hub Company, Inc., a corporation of Illinois

Filed Feb. 10, 1969, Ser. No. 797,934
Int. Cl. F16m *11/16*
U.S. Cl. 248—188 5 Claims



A formed metal support leg for attachment to a bed or furniture frame, with the leg having a flat side surface adjacent the upper end thereof and a pair of oppositely disposed, outwardly extending tabs at the uppermost end of the leg. When the leg is secured to the furniture frame structure, the flat side surface seats against a side surface of the supporting frame and the outwardly extending tabs abut an underside of the furniture support frame.

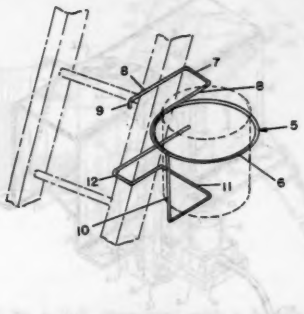
3,559,939

COMBINATION SUPPORT AND HOLDER FOR PAINT CAN

Salvador Luna, 7114 Wheeler, Detroit, Mich. 48210

Filed Apr. 5, 1968, Ser. No. 719,030
Int. Cl. E06c *7/14*
U.S. Cl. 248—210 3 Claims

A paint can holder formed from a single piece of stiff wire having a loop portion to receive the can, two hook members extending outwardly from the loop portion in vertically



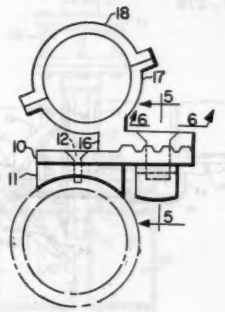
spaced relationship and being of a configuration as to permit the holder to be mounted on either side of a ladder.

3,559,940

QUICK DETACHABLE AND REPLACEABLE GUNSIGHT MOUNT

George R. Kruzell, 4301 Hotchkiss, Bay City, Mich. 48706

Filed Oct. 16, 1968, Ser. No. 767,963
Int. Cl. F41g *1/38*
U.S. Cl. 248—216 3 Claims



A telescopic gunsight mount capable of being quickly detachable from and replaceable on a gun by means of the wedging action between inclined grooves on a threadless bolt and similar inclined surfaces on a locking bar.

3,559,941

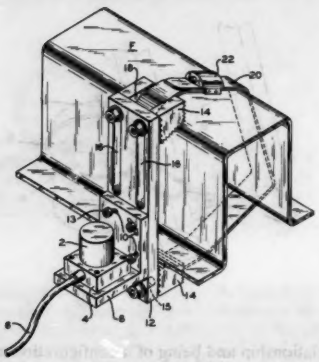
MOUNTING DEVICE

James W. Holzman, Grosse Ile, Mich., assignor to Dana Corporation, Toledo, Ohio, a corporation of Virginia

Filed Sept. 26, 1968, Ser. No. 762,848
Int. Cl. B65d *63/08*
U.S. Cl. 248—228 3 Claims

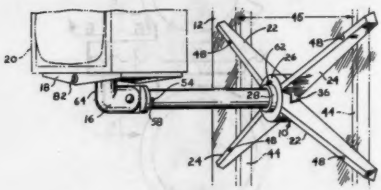
A mounting assembly for securing a measuring device requiring a specific orientation to a variety of structures. The device includes a pair of adjustable, spaced mounting blocks, secured to a base plate, which are adapted to conform to a variety of supporting shapes. Serrations on the hardened steel mounting blocks provide secure placement when the as-

sembly is clamped to the supporting structure. The combination of an angled bracket including appropriately placed ar-



cuate slots provide even greater versatility in orienting the device.

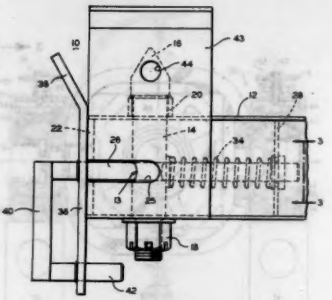
3,559,942
ARTICLE MOUNTING MEANS
Joseph A. Lucasey, 2950 Northwood Drive, Alameda, Calif.
Filed Feb. 29, 1968, Ser. No. 709,342
Int. Cl. A47g *29/00*
U.S. Cl. 248—278 **5 Claims**



A mounting member for securing an article to a horizontal or vertical support surface. The mounting member has a pair of adjustable legs so as to provide rapid easy attachment to wall studs behind a vertical wall, and to provide the most advantageous horizontal base on a horizontal platform such as a floor.

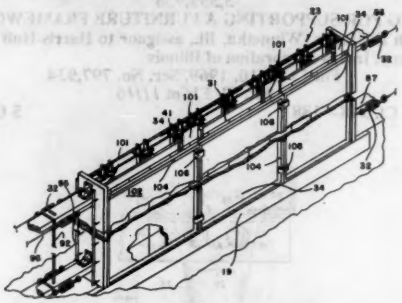
3,559,943
CONTAINER LATCH MECHANISM
Evan Hammond, Michigan City, and Michael Lapaich, Rolling Prairie, Ind., assignors to Clark Equipment Company, a corporation of Delaware
Filed Oct. 28, 1968, Ser. No. 770,994
Int. Cl. B65d *19/38*; **B61d** *45/00*
U.S. Cl. 248—361 **11 Claims**

A latch mechanism for latching either of two types of containers to a supporting structure. Movement of the mechanism between the unlatched position and the latched position latches to the supporting structure whichever type of container has been placed thereon. The mechanism includes a vertically disposed pivotal member which carries a latch head portion at one end thereof for latching one type of container. Also included in the mechanism is a detent which is arranged to project through an opening in a portion of the



supporting structure and into a mating opening in another type of container to latch it in position.

3,559,944
MEANS FOR CONSTRUCTING A HOLLOWED WALL CONCRETE STRUCTURE
Victor J. Clough, 1647 S. Madison, Wichita, Kans. 67211
Filed July 12, 1967, Ser. No. 652,842
Int. Cl. E04g *11/18*
U.S. Cl. 249—36 **9 Claims**

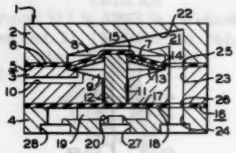


This disclosure relates to a method and means for the construction of a prestressed hollow concrete wall used for the rapid and economical construction of an entire house or the like. More particularly, this disclosure relates to the use of collapsible form means to construct by the method of this disclosure a hollow wall structure with inner support columns insulated from adjacent parallel outer walls to prevent temperature transfer therebetween. Still, more specifically, this disclosure relates to a means and method of constructing an entire section of a hollow cored wall requiring little time and expanse to produce a structure that is fireproof, insect and rodent proof, and can be readily produced with a variety of decorative wall designs. Additionally, this disclosure relates to the use of collapsible form means operable to present an upright structure that can be sprayed with a fluid construction material to form a wall structure thereon whereby, upon solidification of the material, the form means can be readily removed.

3,559,945
DIAPHRAGM OPERATED FLUID LOGIC VALVES
Ronald W. Coiner, Irwin, and Donald Brown, Monroeville, Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa., a corporation of Pennsylvania
Filed Apr. 28, 1969, Ser. No. 819,785
Int. Cl. F16k *11/10, 31/385*
U.S. Cl. 251—61.2 **10 Claims**

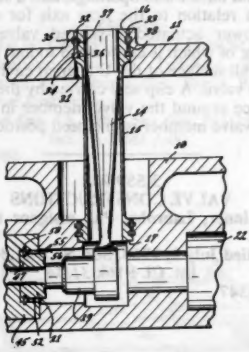
A diaphragm-operated logic valve, in which, a Belleville-

type spring biases a valve operator in a first axial direction, and a first diaphragm, when subjected to a control pressure, overcomes the spring bias whereupon the valve operator is moved by way of snap action of the spring in the opposite axial direction. A second diaphragm, captured at its outer periphery between a pair of housing sections to form a seal, includes a central portion, one side of which is engaged by



the valve operator and sealingly overlies the bore in which the valve operator is disposed for movement, and the other side of which overlies a valve seat in a cavity to serve as a valve which engages the valve seat when the valve operator is moved by the control pressure on the first diaphragm. In a modification, the other side of the second diaphragm may carry an auxiliary operator which controls operation of a third diaphragm as a valve.

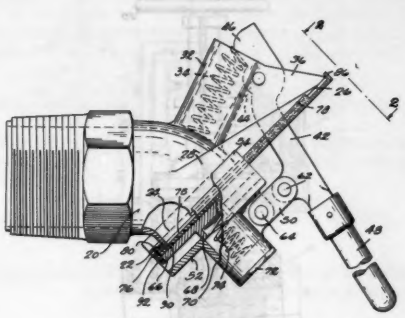
3,559,946
BOND FOR METAL TO METAL JOINTS
David W. Baxter, Jr., Sylmar, Calif., assignor to Bell Aerospace Corporation, a corporation of Delaware
Filed Nov. 19, 1968, Ser. No. 776,928
Int. Cl. F16k *31/06*; B21k *25/00*
U.S. Cl. 251—129 **3 Claims**



Disclosed is an electromagnetically operated force motor which positions a valve member with respect to a valve seat to open and close a valve, thereby controlling the flow of fluid through a chamber which is sealed with respect to the force motor. Various portions of the force motor are maintained in position by a mechanical bond which provides a fluidtight seal.

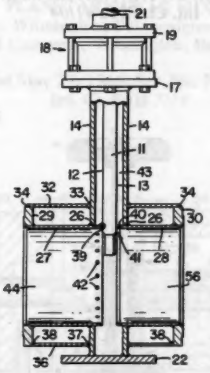
3,559,947
GATE VALVE
Edward F. Sette, Oakland, Calif., assignor to Sette Products Co., Oakland, Calif., a corporation of California
Filed Aug. 1, 1968, Ser. No. 749,455
Int. Cl. F16k *3/04*
U.S. Cl. 251—147 **4 Claims**

A ported body with an extension providing a way has a separately fabricated nylon facing mounted on the way. A slide having a flange interlocking it with the way is reciprocable along the way and carries a metal valve member with a facing complementary to that of the valve body and adapted, on reciprocation of the slide, to open and close the port of the valve body and its facing. A spring mounted on the slide biases the valve toward the way as the slide and valve are



reciprocated by a link connected with a handle which is urged by a spring on the body toward a position in which the valve is closed.

3,559,948
GATE VALVE CONSTRUCTION
Marvin H. Grove, Houston, Tex., assignor to M & J Valve Company, Houston, Tex., a corporation of Texas
Filed Sept. 19, 1968, Ser. No. 760,832
Int. Cl. F16k *3/16*
U.S. Cl. 251—174 **2 Claims**

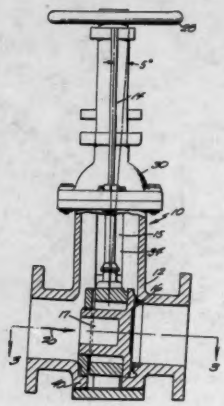


A gate valve suitable for applications where the pressure on one side of the valve is negligible or relatively low, while the pressure on the other side of the valve may be substantially higher. A resilient seal is provided between the end of the wall of the body and the gate on one side of the valve, namely that side which may have a substantial pressure applied. On the other side of the body, the body space is ported to the corresponding flow passage of the valve, whereby leakage from the higher pressure side cannot apply to the body.

3,559,949
GATE VALVE
Ernest Muller, Sydney, 2066, Australia (220 Burnsbay Road Lane Cove W.)
Filed Feb. 16, 1967, Ser. No. 616,562
Int. Cl. F16k *25/00*
U.S. Cl. 251—203 **1 Claim**

The specification discloses a construction similar to stan-

dard gate and parallel slide valves with the improvement that

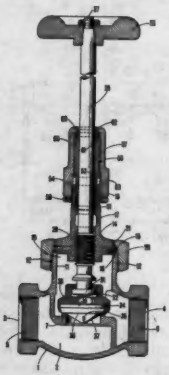


the spindle or stem for such valve is inclined to the axis of the body in which it is disposed by about 5° or slightly more.

3,559,950
VALVE

Donald R. Nelson, Worcester, Mass., assignor to Gooddard Industries, Inc., Worcester, Mass., a corporation of Massachusetts

Filed Nov. 21, 1967, Ser. No. 684,708
Int. Cl. F16k *41/04*
U.S. Cl. 251—214 4 Claims

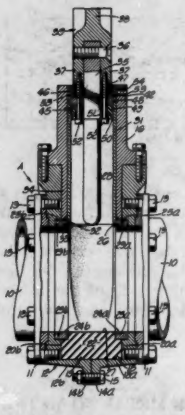


A globe valve adapted for use at cryogenic temperatures having a valve seat in the valve body adapted to be closed by a conical seat disc. The seat disc is supported for vertical movement in a seat holder having a downwardly flared peripheral flange rolled about the seat disc periphery. The holder is carried by an elongated stem which extends through the valve bonnet. The stem and bonnet are sealed by a series of compressed Teflon and brass rings concentric with and between the upper end of the valve bonnet and the stem. The rings are axially compressed between a flange formed in the valve bonnet and a sleeve follower which in turn is secured by a packing nut with a washer between one end of the packing nut and the sleeve follower.

3,559,951
GATE VALVE FOR CEMENT AND LIKE MATERIALS

Marvin E. Whiteman, Jr., Northridge, Calif., assignor to Whiteman Manufacturing Company, Pacoima, Calif., a corporation of California

Filed June 4, 1968, Ser. No. 734,385
Int. Cl. F16k *3/02*
U.S. Cl. 251—214 3 Claims

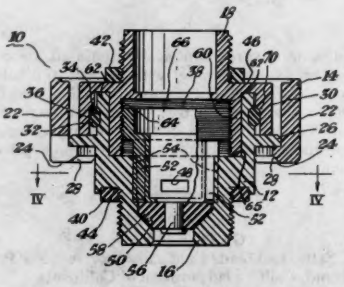


A gate valve for controlling flow of abrasive materials such as cement and the like in which metal-to-metal contact is eliminated in the valving parts by providing a valve housing having a renewable or replaceable cartridge of molded or otherwise formed resilient material, the cartridge having a U-shaped internal cavity transversely of the flow axis between aligned inlet and outlet wall openings, and a sidewall opening in right-angled relation to the flow axis for endwise movement of a power actuated U-shaped valve member, the peripheral edge of which is conformed to and adapted to seat on the inner wall surface of the U-shaped cavity in the closed position of the valve. A cup seal carried by the valve member closes the space around the valve member in the side opening, when the valve member is in closed position.

3,559,952
VALVE CONSTRUCTIONS

Harvey G. Skinner, Labrobe, Pa., assignor to Vulcan Inc., Latrobe, Pa.

Filed July 1, 1968, Ser. No. 741,363
Int. Cl. F16k *31/44*
U.S. Cl. 251—347 11 Claims



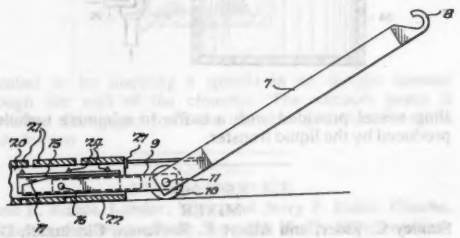
I disclose a valve construction comprising a body section, a handle member, means for rotatably and sealingly mounting said handle member on said body section, means for restraining said handle member against axial movement relative to said body section, a floating valve stem mounted

within said body section for movement toward and away from a valve seat thereof, means for restraining said valve stem against rotation relative to said body section, and cooperative means on said handle and on said valve stem for translating rotary movement of said handle member into axial movement of said valve stem toward and away from said valve seat.

3,559,953
TRUCKS

Alexander Litchard, 322 N. Main St., Wellsville, N.Y. 14895

Filed Oct. 11, 1968, Ser. No. 766,732
Int. Cl. B62b *11/00*
U.S. Cl. 254—8 **4 Claims**

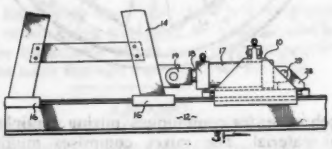


This disclosure is of a truck which is small in size but constructed to transport heavy loads positioned on pallets. These trucks are handled manually to position them in relation to a pallet and are then connected with a power-operated vehicle by means of handles which are first moved into a more nearly horizontal position to lift the pallet to a slight extent with one end thereof resting on the ground or floor, in which position the pallet is then moved from one position to another without materially changing the pallet from a horizontal position.

3,559,954
HYDRAULIC GRIPPER AND MOVING JACK

Henry B. Chambers; Clair W. Tellefson, Santa Barbara, Calif., assignors to Hydranautics, Santa Barbara, Calif., a corporation of California

Filed Jan. 15, 1969, Ser. No. 791,253
Int. Cl. B66f *1/00*
U.S. Cl. 254—106 **7 Claims**



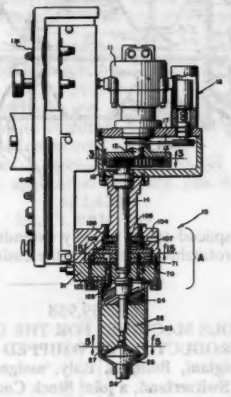
A hydraulic gripper and moving jack for moving heavy structures such as an oil derrick along a flanged member is disclosed. The gripper engages the flanged member with a frictional grip. The gripping forces are developed by a hydraulic cylinder which acts on the flanged member through hinged side plates; a second piston coupled to the heavy structure enables the structure to be walked along the flanged member.

3,559,955
CHEMICAL INGREDIENT EATING APPARATUS

Lucas J. Wydeveld, Cincinnati, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill., a corporation of Delaware. by mesne assignments

Filed May 14, 1968, Ser. No. 729,106
Int. Cl. B01f *7/16*
U.S. Cl. 259—8 **19 Claims**

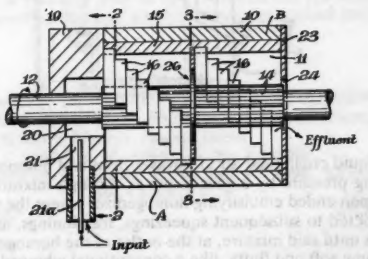
A mixing-head assembly for a chemical ingredient treating system is provided characterized in that a shift from recirculation mode to feed-to-mixing-chamber mode of operation may be carried out by valve means which limits the possibility of leakage of chemical components, while metering-port construction, which permits variable flow control, also contributes to control of any possible leakage. Close control of mixing-chamber conditions is provided for by means which inhibits transfer of heat from the source of motive force to the mixing chamber, and means is provided for preventing undesired air pickup by the mixture in the mixing chamber.



3,559,956
PLANETARY GEAR MIXER

Joseph B. Gray, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Filed May 27, 1968, Ser. No. 732,212
Int. Cl. B01f *7/14*
U.S. Cl. 259—5 **3 Claims**



A planetary gear mixer having multiple sets of mixing gears offset one set from another circumferentially to eliminate longitudinal leakage paths therethrough.

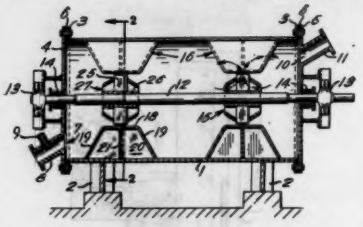
3,559,957
TURBINE-TYPE CHLORINE MIXER

Alfred Max Hurter, Beaconsfield, Quebec, Canada, assignor to Stadler Hurter International Ltd., Montreal, Quebec, Canada

Filed Oct. 11, 1968, Ser. No. 766,901
Claims priority, application Great Britain, Oct. 20, 1967, 47904/67
Int. Cl. B01f *7/04*
U.S. Cl. 259—10 **9 Claims**

An apparatus for continuously mixing together pulp and chlorine which comprises a cylindrical casing, spaced-apart

stationary agitating elements extending in a circular row about, and attached to, the inner wall of the casing, and a plurality of spaced-apart, radially extending blades mounted on an axial, rotatable shaft within the casing.

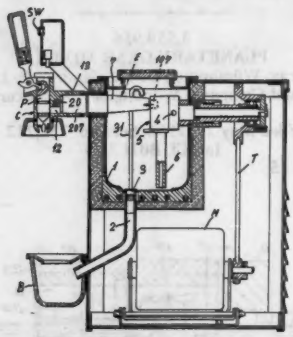


3,559,958

CONTINUOUS MACHINES FOR THE INSTANTANEOUS PRODUCTION OF WHIPPED CREAM

Poerio Carpigiani, Bologna, Italy, assignor to APAW S.A., Fribourg, Switzerland, a joint Stock Company incorporated of Switzerland

Filed Nov. 20, 1968, Ser. No. 777,434
Claims priority, application Italy, Nov. 20, 1967, July 8, 1968, 7442A/67;7152A/68
Int. Cl. B01f 7/04
U.S. Cl. 259—10 **8 Claims**



Liquid cream and air are drawn from and pumped under a strong pressure by a gear pump as a rough mixture through an open ended emulsifying homogenizer where the mixture is subjected to subsequent squeezings, fractionings, and expansions until said mixture, at the outlet of the homogenizer, has become soft and fluffy, like a conventional whipped cream.

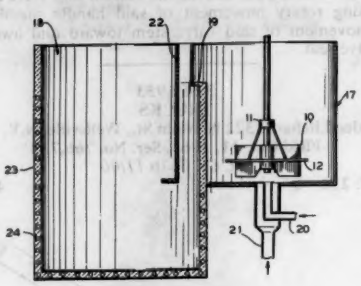
3,559,959

IMPELLER AND MIXER-SETTLER APPARATUS

Walter M. Davis, Beverly, Mass., and Edwin A. Matzner, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

Filed Aug. 13, 1968, Ser. No. 752,231
Int. Cl. B01f 7/16
U.S. Cl. 259—23 **4 Claims**

A variable ratio impeller apparatus in which vanes extend through perforations in a baffle which is movable to vary the proportion of the vanes extending on either side of the baffle permits adjusting the ratio of mixing action to pumping action produced by the impeller. In a mixer-settler liquid-liquid contact apparatus, the impeller apparatus is substantially vertically positioned in a mixing vessel with the vanes extending over and spaced not more than 0.05 times the diameter of their sweep from proximately located plural inlets communicating with the bottom of the mixing vessel. Means are provided for transferring liquid from the mixing vessel to a settling vessel provided with a baffle to minimize turbulence produced by the liquid transfer.

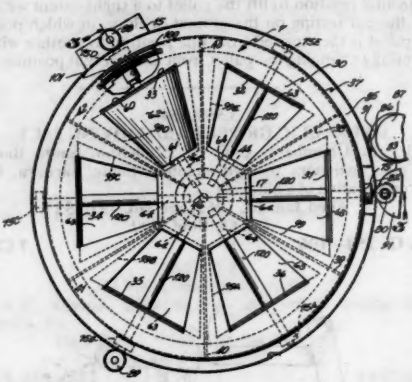


3,559,960

MIXER

Stanley C. Elder, and Albert C. Reckman, Cincinnati, Ohio, assignors to A. R. Industries, Inc., Cincinnati, Ohio, a corporation of Ohio

Filed Mar. 26, 1969, Ser. No. 810,535
Int. Cl. B01f 9/00
U.S. Cl. 259—58 **14 Claims**



A batch mixer for continuously mixing multiple batches of discrete material. The mixer comprises multiple mixing chambers which continuously move in an orbital path of movement and while so moving, are filled with material, the material is mixed, and the chambers dumped. Mixing is effected by rotation of a blade mounted within each of the chambers.

This invention is an improvement upon the apparatus disclosed and claimed in U.S. Pat. No. 3,319,941, issued May 16, 1967, and assigned to the assignee of this application.

3,559,961

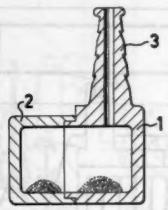
APPARATUS AND METHOD FOR THE PRODUCTION OF DENTAL MIXTURES POOR IN POROSITY

Gunnar Bergendal, Bergslagsvagen 268, Bromma, near Stockholm, Sweden

Filed Aug. 16, 1968, Ser. No. 753,178
Claims priority, application Sweden, Aug. 28, 1967, 11947/67
Int. Cl. B01f 11/00
U.S. Cl. 259—72 **4 Claims**

Apparatus and method for production of dental mixtures poor in porosity from a pulverous material and a material in

a liquid state. The two materials are inserted in a chamber which is evacuated by means of a vacuum pump so that the pulverous material is substantially removed from air. The mixing is then performed under vacuum by shaking the



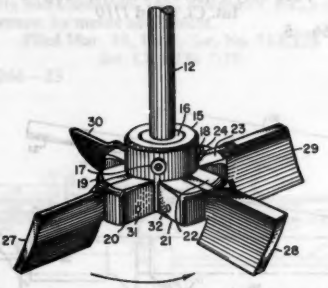
chamber or by inserting a spatula in an airtight manner through the wall of the chamber. The vacuum pump is thereafter disengaged from the chamber and the mixture is ready for use.

3,559,962

STIRRING DEVICE

Bruno E. Enssle, Lander, Wyo., and Jerry P. Malec, Omaha, Nebr., assignors to Binks Research & Development Corporation, Boulder, Colo.

Filed June 10, 1968, Ser. No. 735,822
Int. Cl. B01f *7/18*
U.S. Cl. 259—111 **1 Claim**



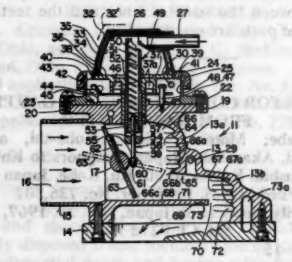
A device for stirring liquid contained in a bung-type drum, the stirring action being generated by a shaft-mounted rotor having vanes retractable into a configuration permitting insertion of the rotor through the bung with the shaft.

3,559,963

ATOMIZATION AND FUEL CUTOFF CARBURETOR

Oscar R. Cedarholm, 4 Cedar Lane, Eureka, Calif. 95501

Filed Dec. 3, 1968, Ser. No. 780,860
Int. Cl. F02m *7/22*
U.S. Cl. 261—50 **13 Claims**



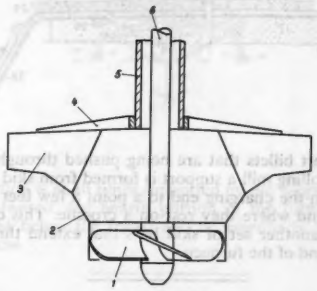
A vehicle carburetor includes a mixing chamber for finely atomizing fuel charges and a pressure responsive pneumatic relay valve for automatically terminating the flow of fuel to the air and fuel-mixing chamber in response to vehicle deceleration. The relay valve is physically separated from the mixing chamber and operates to quickly cut off the supply of fuel when there is a temporary lack of demand for the fuel in order to minimize air pollution and smog effects. Fuel droplets trapped in corrugations on the mixing chamber wall are blasted by an inducted air stream to atomize the fuel.

3,559,964

DEVICE FOR MECHANICAL GASIFICATION OF LIQUIDS

Guenther Sell, Kelsterbach, and Joerg Lohmann, Eschborn, Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany, a German company

Filed Jan. 2, 1969, Ser. No. 788,477
Claims priority, application Germany, Jan. 4, 1968, 1,632,423
Int. Cl. B01f *3/04*
U.S. Cl. 261—91 **3 Claims**



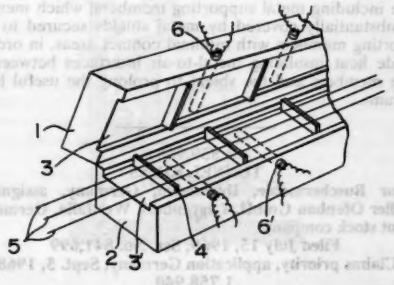
A device for the gasification of liquids comprising a radially effective rotatable conveyor disposed on the liquid surface and an axially operating rotatable conveyor within the inlet mouth of the radially effective conveyor, the conveyors being separate from each other and independently driven so that one may be driven at a different rate of speed than the other. The radial conveyor is formed in part with hollow walls which are in connection with the gas phase through apertures in one face wall. In the rotor channel are disposed baffled openings through which gas may be sucked into the liquid.

3,559,965

APPARATUS FOR HEATING SYNTHETIC FILAMENTS

Kinyu Ishida, and Yasuhiro Okamura, Ehime-ken, Japan, assignors to Teijin Limited, Osaka, Japan

Filed July 18, 1969, Ser. No. 843,004
Claims priority, application Japan, July 23, 1968, 43/51966
Int. Cl. F27b *9/28*
U.S. Cl. 263—3 **5 Claims**



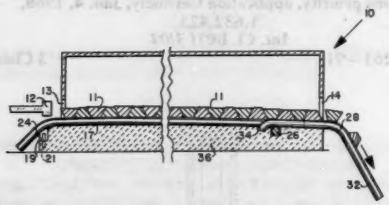
An apparatus for heating a great number of synthetic filaments or a tow uniformly and with good thermal efficiency in

a slit-type heater while having them run in and out of the slit by disposing a plurality of buffer plates in the slit to obstruct outside air flowing into the slit with the running filaments, and thereby prevent a drop of air temperature in the slit, and make possible a substantially constant air temperature transversely of the slit.

3,559,966
SKID SUPPORT

Richard L. Croiter, Yonkers, N.Y., assignor to Anaconda Wire and Cable Company, a corporation of Delaware

Filed Feb. 7, 1969, Ser. No. 797,479
Int. Cl. F27b *9/14*
U.S. Cl. 263—6 **6 Claims**

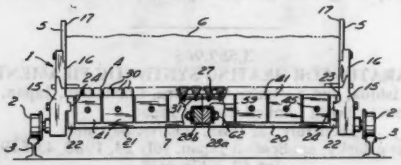


To support billets that are being pushed through the furnace of a rolling mill a support is formed from skid bars that extend from the charging end to a point a few feet from the discharge end where they rest on a crosstie. This crosstie is welded to another set of skid bars that extend through the discharge end of the furnace.

3,559,967
TRAVELING GRATE APPARATUS WITH HEAT SHIELDING

Tage Werner, Rocky River, Ohio, assignor to Arthur G. McKee & Company, Cleveland, Ohio, a corporation of Delaware

Filed Mar. 26, 1969, Ser. No. 810,624
Int. Cl. F27b *9/00, 21/02*
U.S. Cl. 263—28 **10 Claims**



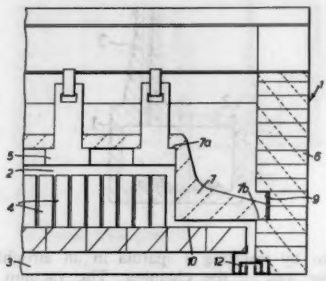
Traveling grate apparatus adapted to be subjected to severe and fluctuating elevated temperatures has supporting frame including metal supporting members, which members are substantially covered by metal shields secured to such supporting members with minimal contact areas, in order to provide heat insulating metal-to-air interfaces between the frame members and the shield to prolong the useful life of the frame.

3,559,968
TUNNEL KILNS

Gregor Buschermohle, Ibbenburn, Germany, assignor to Keller Ofenbau GmbH, Laggenbeck Westfalia, Germany, a joint stock company

Filed July 15, 1969, Ser. No. 841,699
Claims priority, application Germany, Sept. 5, 1968, 1,758,940
Int. Cl. F27b *9/00*
U.S. Cl. 263—28 **4 Claims**

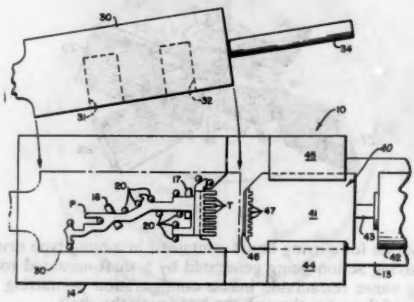
A tunnel kiln includes a suspended roof which is spaced at each longitudinal edge from the sidewalls, the intermediate space is filled with a series of refractory bricks each of which is profiled so that its lower surface lies close to the upper surface of an unladen part of the ceramic ware trolley of the kiln.



3,559,969
QUENCHING AND STRAIGHTENING DEVICE FOR HEAT TREATING MACHINE

Thomas G. Eannarino, Park Ridge, Ill., assignor to Teletype Corporation, Skokie, Ill., a corporation of Delaware

Filed May 14, 1968, Ser. No. 728,992
Int. Cl. C21d *1/10*
U.S. Cl. 266—5 **7 Claims**



A quenching and straightening mechanism for parts having rows of tined projections includes a blade having a thickness equal to the distance between the rows of tines and teeth, mounted on the blade, and having widths equal to the distance between the tines in a row. An air cylinder drives the blade between the rows of tines and the teeth between the tines as the parts are quenched.

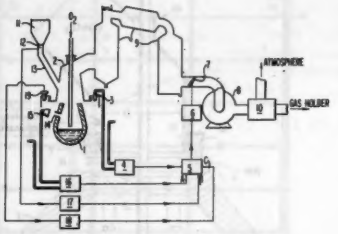
3,559,970
APPARATUS FOR CONTROLLING THE GAS PRESSURE FROM A CONVERTER

Ichizo Hamabe; Motoaki Hirao, Kobe-shi, and Gunji Kagamiuchi, Akashi-shi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Ikuta-Ku, Kobe, Japan

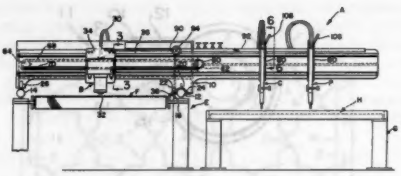
Filed May 3, 1968, Ser. No. 726,502
Claims priority, application Japan, Dec. 22, 1967, 42/82267
Int. Cl. F27d *19/00*
U.S. Cl. 266—15 **6 Claims**

A system for controlling the pressure of the gas generated from a converter in noncombustion state and collected in a hood with atmospheric air being excluded from the hood including cooling and dust removing means for the gas before

the gas is stored. The pressure of the gas within the hood is detected as one signal factor, said detected signal factor being applied to an adjusting instrument so as to actuate a mechanism in said system for controlling the pressure of the gas by opening and closing a damper located in a duct leading from the hood. The system further includes a mechanism for delaying the time the damper in said duct is opened or closed by applying a signal factor other than said signal factor derived from the pressure of the gas in said hood to said adjusting instrument.



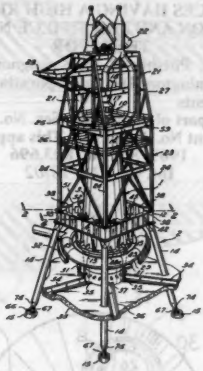
3,559,971
CONTOUR CUTTING DEVICE
Lawrence J. Rogers, Maple Heights, Ohio, assignor to Air Products and Chemicals, Inc., Allentown, Pa., a corporation of Delaware. by mesne assignment
Filed Mar. 19, 1968, Ser. No. 714,178
Int. Cl. B23k *7/10*
U.S. Cl. 266—23 **10 Claims**



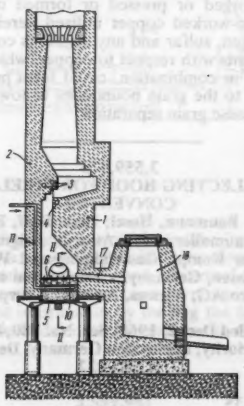
There is provided a contour cutting device wherein a torch follows a path traced by a photosensitive head over a preselected pattern. This device includes a three point guide assembly for movement of the torch in one direction and a tension adjusting arrangement for a chain for movement of the torch in a second direction.

3,559,972
FURNACE APPARATUS
Melvin J. Greaves, Cleveland, and Tage Werner, Rocky River, Ohio, assignors to Arthur G. McKee & Company, Cleveland, Ohio, a corporation of Delaware
Original application Jan. 17, 1966, Ser. No. 520,945, now Patent No. 3,431,691, dated Mar. 11, 1969. Divided and this application Aug. 29, 1968, Ser. No. 778,883
Int. Cl. C31b *7/08*
U.S. Cl. 266—25 **25 Claims**

Shaft furnace apparatus comprising an upstanding furnace shell, and a supporting structure comprising a frame surrounding and spaced from the shell including generally horizontally disposed frame members joined end to end and being of substantial depth and having sides facing the shell, spaced legs supporting the frame, and a plurality of connector means fixed to such sides of the frame members and to the shell to support the shell from the frame, and means connected to the members forming the frame to resist tilting of the frame members about generally horizontal axes during expansion of the shell on heating of the furnace. Preferably, at least 25 percent of the weight of the furnace above the bosh portion is at all times supported by the supporting structure. If desired, the hearth portion of the furnace may be suspended below the frame and be essentially unsupported from below.



3,559,973
GAS CUPOLA FURNACE
Vladimir Alexandrovich Grachev, ul. Uritskogo, 74, kv.9; Anatoly Alexeevich Cherny, ul. Tsiolkovskogo, 41, kv.32, Penza; Lev Mikhailovich Marienbakh, Bolshaya Cherkizovskaya, 5, Korp. 1, Kv.73, Moscow, and Ivan Lukich Kurbatsky, ul. Volodarskogo, 74, Kv.4, Penza, U.S.S.R.
Filed Feb. 1, 1967, Ser. No. 613,166
Claims priority, application U.S.S.R., Feb. 1, 1966, Feb. 1, 1966, June 27, 1966, June 27, 1966, 1,052,704;1,052,599;1,088,888;1,087,642
Int. Cl. F27b *1/04*; F27d *7/02*
U.S. Cl. 266—27 **4 Claims**



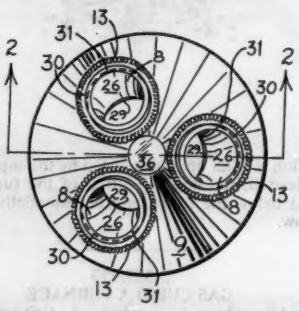
A gas cupola furnace comprises a shaft, having at the bottom thereof, a hearth in which molten metal is superheated

by introduction of a combusted gaseous fuel into a tunnel which leads to the hearth, the molten metal having various reagents added thereto by means of channels which lead to the molten metal which channels may be disposed in the walls of the shaft or the walls of the hearth.

3,559,974
OXYGEN LANCES HAVING A HIGH RESISTANCE TO DETERIORATION AND MULTIPIECE NOZZLE HEADS THEREFOR

Walter V. Berry, Pittsburgh, Pa., assignor to Berry Metal Company, Wilmington, Del., a corporation of Delaware. by mesne assignments

Continuation-in-part of application Ser. No. 445,100, Apr. 2, 1965, now Patent No. 3,430,939. This application Mar. 3, 1969, Ser. No. 803,696
Int. Cl. C21c *13/02*
U.S. Cl. 266—34 **12 Claims**



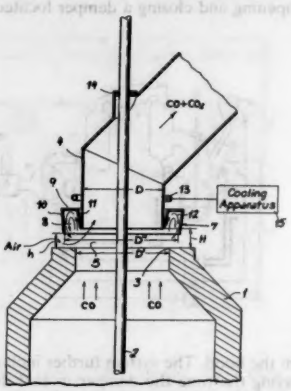
Oxygen lances having a high resistance to deterioration comprising a shank and a multipiece nozzle connected thereto wherein the multipiece nozzle includes a worked metal, e.g. copper, base portion, worked metal, e.g. copper, oxygen conduits and a cast metal, e.g. copper, body portion including oxygen conduit means connected to said worked metal, e.g. copper, oxygen conduits. The terminology "worked" means forged or pressed or formed or extruded or swaged. The so-worked copper utilized herein is free from oxygen, hydrogen, sulfur and any elements considered to be "tramp" elements with respect to copper, which elements by themselves, or in combination, could form precipitates that would migrate to the grain boundaries to lower the physical properties or cause grain separation.

3,559,975
GAS-COLLECTING HOOD FOR STEEL-MAKING CONVERTER

Karl-Friedrich Baumann, Hosel; Hans Hoff, Essen-Bredeney, and Kurt Braumuller, Graz, Austria, assignors to Gottfried Bischoff, Bau Kompl. Gasreinigungsund Wasserruckklanlagen KG, Essen, Germany, a corporation of Germany and Waagner-Biro AG, Vienna, Austria, a corporation of Austria

Filed Dec. 2, 1968, Ser. No. 780,456
Claims priority, application Germany, Dec. 2, 1967, 1,583,222
Int. Cl. C21c *5/42*
U.S. Cl. 266—35 **9 Claims**

A gas-collecting hood is arranged over the circular outlet or mouth of a top-blown steel-making converter. This hood comprises a cylindrical tube or duct with a smaller diameter than the mouth coaxial therewith. The tube is fitted with an outer trough which opens downwardly and sustains a crown vortex feeding back into the main stream. This trough has an outer wall or apron whose diameter is greater than that of the mouth and whose lower periphery is positioned below the

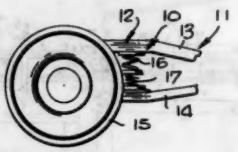


bottom end of the tube, while being spaced above the converter.

3,559,976
VARIABLE STIFFNESS SUSPENSION SYSTEM

Joseph Jerz, Jr., 131 Wylerhorn St., Crestline, Calif. 92325

Filed Oct. 17, 1968, Ser. No. 768,249
Int. Cl. F16f *1/12*
U.S. Cl. 267—61 **17 Claims**



A vehicle suspension system including two springs connected in series, with one of the springs being stiffer than the other, and with the springs being so related that under normal load conditions the softer of the two springs is effective to provide a very gently cushioned ride, while upon the imposition of heavier load forces, the vehicle is supported more stiffly and primarily by the stronger spring. The conversion between these two conditions may be effected automatically, by engagement under heavy load conditions of a pair of stop shoulders acting to limit compression of the light spring. Similarly, upon excessive extension of the springs, an additional set of stop shoulders may automatically become effective to limit the amount of extension of the softer spring and cause the stiffer spring to resist further extension. A shock absorber may be utilized in conjunction with the springs, and may itself carry or include one or more of the stop shoulders.

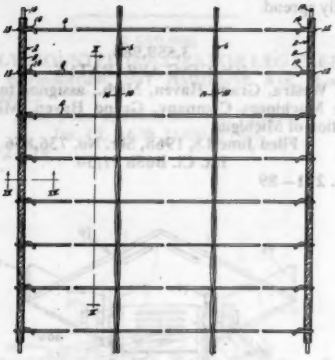
3,559,977
PADDING SUPPORT FOR UPHOLSTERED FURNITURE

Robert O. Isaacs, Joplin, Mo., assignor to Flex-O-Lators, Inc., Carthage, Mo., a corporation of Missouri

Filed Dec. 13, 1968, Ser. No. 783,574
Int. Cl. F16f *3/00*
U.S. Cl. 267—90 **12 Claims**

A padding support for upholstered furniture comprising a resilient fabric consisting of a series of parallel, spaced-apart, resilient cross wires extending between and connected at their ends to a pair of parallel side strands extending at right

angles thereto, and a series of parallel, spaced-apart pairs of resilient wires extending parallel to and intermediate said side strands, the wires of each pair being twisted together to connect them both to each other and to said cross wires.

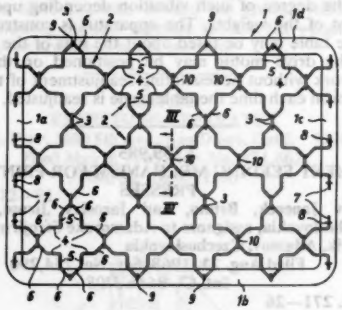


3,559,978

FLAT SPRING ARRANGEMENT FOR USE ON A SPRING WIRE MESH

Otto P. Molt, Hubersbronn, Wurttemburg, Germany

Filed Apr. 1, 1969, Ser. No. 812,110
Int. Cl. A47c *23/16*
U.S. Cl. 267—144 6 Claims



A flat spring for use in spring wire mesh for chairs and beds. The spring wire is bent in substantially zigzag form with the sections of the wire which lie between the apex portions bent further outwardly thereby enabling improved longitudinal and transverse extension.

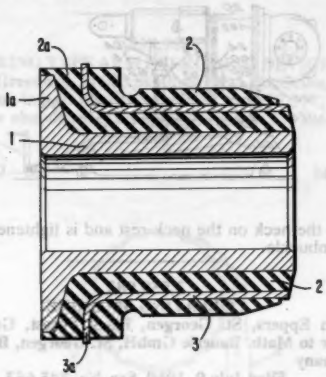
3,559,979

RUBBER METAL COLLAR END-BEARING

Alf John Muller, Bittenfeld, Wurttemberg, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Oct. 10, 1968, Ser. No. 766,609
Claims priority, application Germany, Oct. 12, 1967, 1,625,525
Int. Cl. F16f *16/12*
U.S. Cl. 267—1 2 Claims

A rubber-metal collar end-bearing which includes an inner metal bushing, a rubber part vulcanized to the outer surface of the metal bushing and provided with a collar, and a metal sleeve vulcanized into the rubber part as well as a metal disc vulcanized into the rubber part within the area of the collar thereof; the metal sleeve and the metal disc are preferably made in one piece in the form of a flange-bushing.

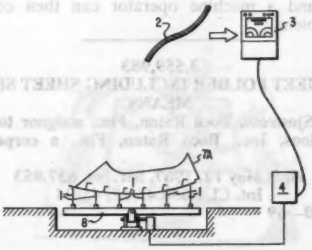


3,559,980

PLATE CONTROLLED JIGS FOR BUILT-UP SURFACE

Kiyoshi Terai, Asiya-shi; Tatsumi Kurioka, and Hideshi Takeuchi, Kobe-shi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Feb. 7, 1969, Ser. No. 797,615
Claims priority, application Japan, Feb. 8, 1968, 43/8975
Int. Cl. B25b *11/02*; B23g *3/18*
U.S. Cl. 269—20 5 Claims



A plurality of spaced, extensible rodlike jigs carried by a support surface in upstanding fashion for supporting a built-up surface are selectively adjusted by central control means from an information storage tape carrying predetermined positional format information by feeding the tape through a transducer which feeds control signals to the central jig control means.

3,559,981

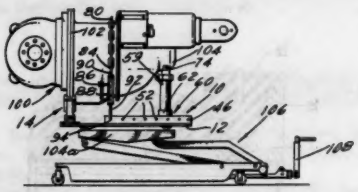
DIFFERENTIAL HANDLING TOOL

Harold R. Abshear, 1520 W. Silliker, La Habra, Calif. 90631

Filed Mar. 26, 1968, Ser. No. 716,180
Int. Cl. B25b *5/14*
U.S. Cl. 269—130 3 Claims

A motor vehicle differential supporting and holding ap-

paratus having adjustable differential flange holders and a neck rest for positioning under the differential neck. A chain



secures the neck on the neck rest and is tightened by means of a turnbuckle.

3,559,982

COLLATING MACHINE

Wilhelm Eppers, St. Georgen, Black Forest, Germany, assignor to Math. Bauerle GmbH, St. Georgen, Black Forest, Germany

Filed July 9, 1969, Ser. No. 845,653
Claims priority, application Germany, Oct. 30, 1961, 1,411,018
Int. Cl. B65h *39/02*
U.S. Cl. 270—58 11 Claims

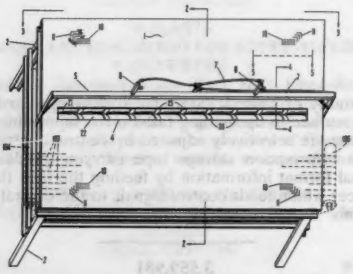
A machine for collating sheets of paper. A photoelectric-sensing device determines whether more than one type of a sheet has been fed, while a spring contact sliding against a roller determines the absence of a sheet. If either more than one sheet is sensed or the absence of a sheet is detected, an electrical path is closed by a cam operated by movement of the conveyor of the machine. This closing shuts down the conveyor and a machine operator can then correct the sensed problem.

3,559,983

LARGE SHEET FOLDER INCLUDING SHEET SECURING MEANS

Robert L. Sjostrom, Boca Raton, Fla., assignor to Sjostrom Automations, Inc., Boca Raton, Fla., a corporation of Florida

Filed May 12, 1967, Ser. No. 637,953
Int. Cl. B65h *45/18*, *45/04*
U.S. Cl. 270—69 7 Claims



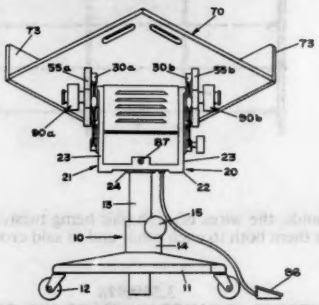
A machine for inspecting and folding manufactured sheets and heavy fabrics such as shower curtains having a table top upon which the sheet can be manually spread and inspected. A longitudinal slot is centrally located in the table top through which the sheet is driven by an airblast or punch bar for effecting a first fold. A series of parallel rolls effects three longitudinal folds in the sheet. A series of rolls perpendicular to the longitudinal rolls sequentially effects three or four folds with the folded sheets being delivered from the machine on a level lower than the table top upon which the sheet was originally spread.

3,559,984

JOGGING APPARATUS

Dan P. Westra, Grand Haven, Mich., assignor to The Challenge Machinery Company, Grand Haven, Mich., a corporation of Michigan

Filed June 13, 1968, Ser. No. 736,856
Int. Cl. B65h *31/34*
U.S. Cl. 271—89 19 Claims



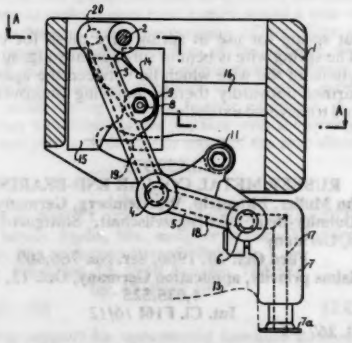
An apparatus for vibrating stacks of paper stock or the like into aligned relationship with one another including a paper supporting table flexibly suspended above a suitable framework. The table has a shaft rotatably affixed thereto and the shaft is provided with adjustable offcenter weights at its extremity. Rotation of the shaft imparts vibration to the table, the degree of such vibration depending upon the adjustment of the weights. The apparatus is constructed such that the table may be tilted about the axis of the shaft and, thus, the drive motor may be positioned on the support framework without necessitating readjustment of the driving mechanism each time the table angle is readjusted.

3,559,985

SHEET-FEEDING MECHANISM FOR PRINTING PRESSES

Jaroslav Janecek, Bruno, and Jaroslav Jiruse, Blansko, Czechoslovakia, assignors to Adamovske Strojirny, Narodni podnik, Adamov, Czechoslovakia

Filed Aug. 21, 1968, Ser. No. 754,290
Int. Cl. B65h *3/08*
U.S. Cl. 271—26 4 Claims



A swingable lever pivoted to a support and having pivotally connected thereto a carrier which is provided with a follower

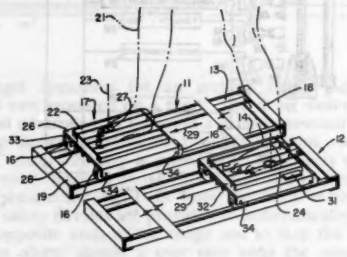
engaging a profiled track in the support for guiding movement of the carrier. A suction rod equipped with suction cups is supported by the carrier, and the carrier as well as the lever are provided with air passage means communicating through the suction rod with the suction cups.

3,559,986

ROLLABLY MOUNTED DOLLIES FOR LEG EXERCISES

Harry C. Ehrmantraut, 541 Hawthorne Ave., Los Altos, Calif. 94022

Filed June 6, 1968, Ser. No. 735,085
Int. Cl. A63b *21/00, 23/04*
U.S. Cl. 272—79 1 Claim



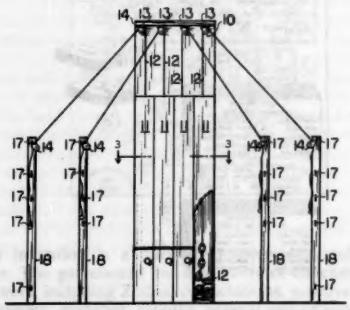
A pair of dollies supported for rolling movement along one or two guideways permits a person to stand with a foot on each dolly and laterally separate the dollies in exercising the leg muscles. Each dolly carries a tread portion pivotally movable to positions disposed at an angle to the direction of separation of the dollies. A method of exercising the leg muscles while in a standing position with a foot on each dolly includes the steps of laterally spreading the two feet apart to permit the torso to settle toward the ground followed by laterally drawing the feet together to raise the weight of the lowered torso toward its initial position.

3,559,987

EXERCISING APPARATUS

Kenneth S. Pear, 3680 5th Ave., San Diego, Calif. 92103

Filed May 5, 1969, Ser. No. 821,662
Int. Cl. A63b *21/06*
U.S. Cl. 272—81 1 Claim



An exercising apparatus especially adapted for use for the muscular development of athletes and others and having a means of progressively increasing the force required as the exercising movement is performed and having an especially unique means of developing the muscles of not only the arms but the muscles of the entire body including the legs as well.

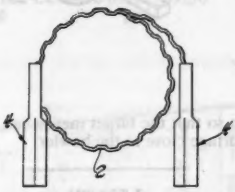
Pulleys are positioned so as to guide a series of lines to different members of different weights in the form of chains enclosed in separated compartments so that the user may change the weight to be lifted.

3,559,988

SPRING TYPE ARM EXERCISING DEVICE

Russell C. Greenless, 316 E. Shadbolt St., Lake Orion, Mich.

Continuation-in-part of application Ser. No. 577,377, Sept. 6, 1966, now abandoned. This application Jan. 13, 1969, Ser. No. 790,720
Int. Cl. A63b *21/00*
U.S. Cl. 272—83 14 Claims



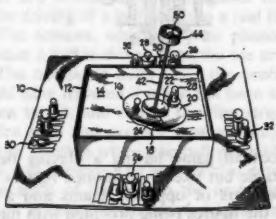
An exercising device including a spring having a coiled configuration in its unstressed condition, and a handgrip attached to each end of the spring operable to uncoil the spring upon relative twisting movement between the handgrips. The unstressed, coiled spring circumscribes an arc of substantially 540° between the handgrips and comprises a sinuous spring having alternating, oppositely facing loop portions.

3,559,989

WATER BALANCING GAME

Jeffrey D. Breslow, Evanston, Ill., assignor to Marvin Glass & Associates, Chicago, Ill., a partnership

Filed Feb. 8, 1968, Ser. No. 704,000
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 1 Claim



A game including a water-filled container, a round-bottom raft floating in the container and including a mast, a "crow's nest" at the upper end of the mast containing a relatively movable marble, a plurality of different size playing pieces for positioning on the raft, and chance means for determining the placement of the playing pieces on the raft. When a player causes the raft to tip sufficiently to spill pieces into the water, he is penalized.

3,559,990

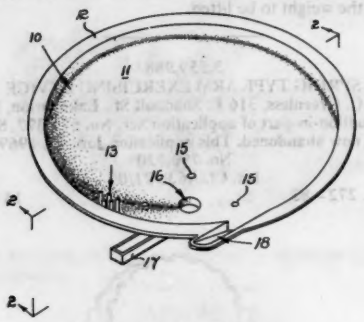
BOWLING GAME APPARATUS WITH SURFACE OF PARABOLOID SHAPE

Arthur Alfred Philpot, 37 Northumberland St., Tusmore, South Australia, Australia

Filed June 13, 1968, Ser. No. 745,649
Int. Cl. A63d *3/02*
U.S. Cl. 273—39 2 Claims

A game apparatus suitable for a game of bowls having a

smooth concave surface of paraboloid shape with target means thereon so that the target means can be positioned on the concave surface close to the bowler.

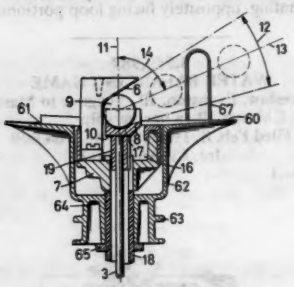


3,559,991

BALL GAME WITH PINCH TYPE PROJECTORS

Karl Immendorf, 33 Weinbergstr, Uberlingen(Bodensee), Germany

Filed June 19, 1968, Ser. No. 738,163
Claims priority, application Germany, Mar. 13, 1968, 35907
Int. Cl. A63f 7/10
U.S. Cl. 273—85 **17 Claims**



A model football game having a playing field and two teams of rotatable but fixedly positioned figures corresponding to the members of opposing teams and a plurality of goals, each of the figures being provided with means for projecting a ball and with defense means positioned therearound. Each projector consists of a vertically movable solenoid operated ball receiving cup and a fixed inclined surface above the cup. As the cup is forced upwardly the ball is pinched between the cup and the inclined surface and is thereby projected.

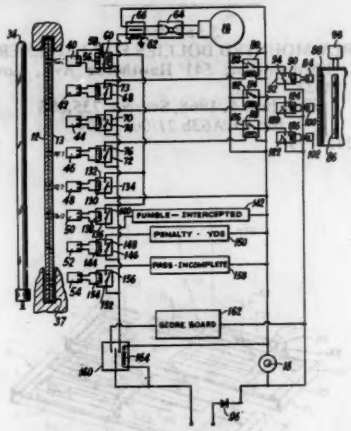
3,559,992

PUNCH CARD OPERATED GAME

Harry Edward Kramer, 104 Hillside Ave., Metuchen, N.J.

Filed Jan. 22, 1968, Ser. No. 699,548
Int. Cl. A63f 7/06
U.S. Cl. 273—94 **19 Claims**

A game device having an electrical control for indicating the advance or backward movement of a token and preferably for advantageously driving the token is operated by a punch card such as a computer-type card having, for example, ten or more cross columns and eighty or more longitudinally arranged columns for storing the playing information. The token advantageously comprises a football, race horse, hockey puck, etc. and the game is played by inserting a card into a control circuit connection and actuating the circuit for obtaining a motor-driven advance or retardation of the token over a playing board or field.

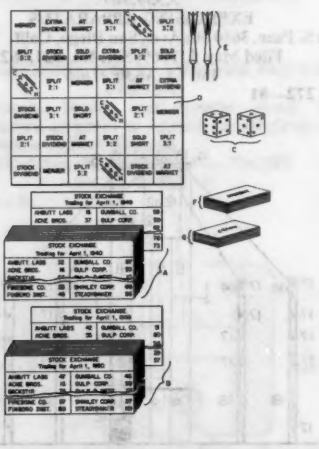


3,559,993

STOCKMARKET GAME AND METHOD

William J. Thomas, 447 Manorview Ave., Mount Pocono, Pa.

Filed Sept. 24, 1968, Ser. No. 762,090
Int. Cl. A63b 65/00
U.S. Cl. 273—95 **4 Claims**

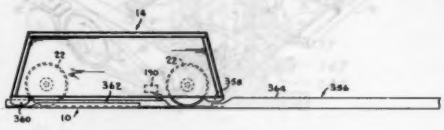


A game is provided, whereby a plurality of persons may play in a simulated stockmarket atmosphere, towards the accumulation of profit, utilizing elements of chance and elements of skills. The game includes buying and selling sheets, each having indicia thereon, a board having indicia thereon related to the buying and selling sheets, a set of darts for use in selecting the indicia on the board, a set of dice and two sets of cards having additional interrelated indicia thereon.

3,559,994
REMOTE CONTROL TARGET FOR A SHOOTING RANGE

Henry A. Larsen, Manitowish Waters, Wis., assignor to Arrowmatic, Inc., Manitowish Waters, Wis., a corporation of Wisconsin

Continuation-in-part of application Ser. No. 420,757, Dec. 23, 1964, now abandoned. This application June 5, 1968, Ser. No. 748,140
Int. Cl. A63b 63/00
U.S. Cl. 273—105.6 3 Claims

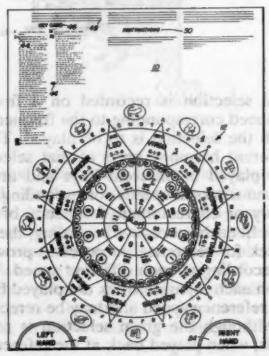


A target apparatus for an archery range including a wheeled cart mounted on a track. The drive motor is energized and controlled by means of a cable connected between a takeup device mounted on the cart and one end of the range. Control circuitry is provided to selectively drive the cart between opposite ends of the range and to position the cart at preselected distances from the front of the range. Various safety devices are provided to automatically stop the cart at opposite ends of the range and to stop the cart and sound an alarm should a user step onto the range. Such devices include cam members which engage the cart and lift it up causing the front wheels to spin freely out of contact with the support surface. They also include an electrically energized warning device which is energized by a foot pad member positioned at the front of the range.

3,559,995
QUESTION ANSWERING GAMEBOARD AND SPINNER

Rufus F. Steadman, Austin, Tex., assignor to Psychomantic Game Company, Austin, Tex., a corporation of Texas

Filed Apr. 29, 1968, Ser. No. 724,993
Int. Cl. A63f 5/04
U.S. Cl. 273—141 5 Claims



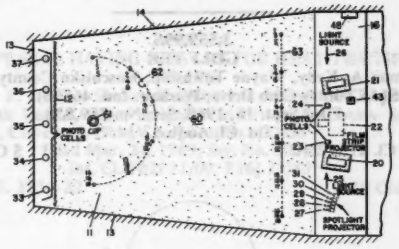
This invention is a question answering gameboard and spinner. The gameboard has a plurality of concentric circles of answers, including Zodiac connotations, positive and negative answers, alphabet, months, several sets of numbers, one set referring to a key chart of answers that also appears on the board, and areas on the edge of the board for receiving the hands of the player that he may concentrate on his questions, and thus influence the correct answers thereto, possibly by Extra Sensory Perception or otherwise. It is intended as a game for entertainment, but is capable of "Ouija" game usage, depending on the individual playing therewith.

At the center of the question answering playing area, a spinner receiving area is provided in the form of a magnet disc having a boss at its center, and a spinner having a pivot aperture at its center point provided with a minimum friction shaft having a base in which is mounted a magnet with spaced apart magnetic poles to be held on the disc by magnetic attraction, and be held against shifting by the boss extending between the spaced apart poles of the magnet.

3,559,996
DEVICE FOR SIMULATING PLAY ON FULL SCALE GOLF COURSES

Robert E. Hopp, New York, N.Y., assignor to Product Investors Corporation, Ltd., New York, N.Y., a corporation of New York

Continuation-in-part of Ser. No. 301,795, Aug. 13, 1963. This application Feb. 9, 1967, Ser. No. 629,339
Int. Cl. A63b 67/02, 69/36
U.S. Cl. 273—176 5 Claims



Apparatus for playing a simulated game of golf includes a display screen target positioned forwardly of a tee area, sensors adjacent the tee area and target, a computer, a film strip projector, spotlight projectors and a putting area located between the target and tee area. The film strip projector includes a film strip showing photographic images of a golf green taken from successive locations, say ten yards apart, along the center of the fairway of a real golf course. In use, a golfer at the tee area sees a projected image of a golf green on the target and drives a golf ball against the target, thus simulating the driving of a golf ball into a real fairway toward the green. The sensors, which may be photoelectric cells, determine when a ball is driven from the tee area and strikes the target. The computer determines the probable distance the ball would have traveled if it had not been stopped by the display screen target, and causes the film strip projector to move the film strip and project another image of the golf green from the location where the ball probably would have landed in the real fairway. The sensors also detect the probable lateral location of the ball in the real fairway and this lateral location is indicated on the projected image by one of the spotlights. The film strip projector is driven by a synchronous motor which moves the film strip in front of the projector aperture at the rate of exactly four frames per second, in response to signals from the computer. The film strip projector also includes a four-spoked capstan which cooperates with a computer controlled solenoid operated latching mechanism for positively framing each film frame.

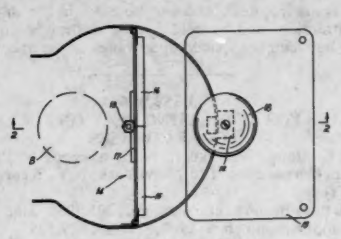
3,559,997
GOLF PUTTING PRACTICE DEVICE

Frederick Joseph Hitch, 188 St. George's Terrace, Perth, Western Australia, Australia

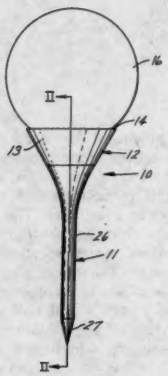
Filed Jan. 23, 1969, Ser. No. 793,309
Claims priority, application Australia, Jan. 25, 1968, 32,570/68
Int. Cl. A63b 57/00, 69/36
U.S. Cl. 273—177 3 Claims

The ends of an arcuate spring member are held apart by a detecting member which is adapted to collapse and actuate a signalling bell when struck by a golf ball putted into the

receiving area defined by the arcuate spring member. The collapsible detecting member includes two parts which are pivotally connected to the arcuate spring member and to each other.



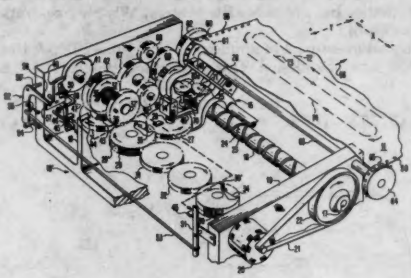
3,559,998
GOLF TEE
Norman A. Kelly, Wayne Township, Koscuisko County, Ind. (1514 Country Club Drive, Warsaw, Ind. 46580)
Filed Sept. 16, 1968, Ser. No. 759,838
Int. Cl. A63b 67/14
U.S. Cl. 273—212 5 Claims



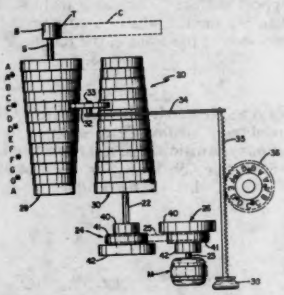
A plastic golf tee having upper and lower parts, the lower part being relatively rigid for insertion into the ground and the upper part being relatively resiliently flexible for engaging and supporting the golf ball, said upper part including a manually engageable, centrally disposed abutment for pressing the lower part of the tee into the ground, said abutment being located so that it does not normally engage the golf ball. The upper part of the tee has a flexible and upwardly diverging sidewall defining a frustum of a core. The upper edge of the sidewall normally supports the ball out of contact with the abutment. A pin extends downwardly from the abutment into an aperture in the lower part to secure the upper and lower parts together.

3,559,999
MAGNETIC HEAD POSITIONER FOR RECORDING AND REPRODUCING APPARATUS
Norwood Kenneth Perkins, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y., a corporation of New York
Filed Dec. 13, 1968, Ser. No. 783,526
Int. Cl. G11b 5/52, 21/04
U.S. Cl. 274—4 12 Claims

A magnetic head, which has an erase gap and a record-playback gap, is movable in opposite directions across a recording medium and always has its erase gap positioned in advance of the record-playback gap irrespective of the direction of movement of the head.



3,560,000
MUSICAL SOUND RECORDING SYSTEM AND METHOD
Lowell Edward Beisner, 8545 W. 64th Ave., Arvada, Colo.
Original application Feb. 16, 1967, Ser. No. 616,717, now abandoned. Divided and this application Oct. 3, 1968, Ser. No. 786,517
Int. Cl. G11b 15/46, 25/06
U.S. Cl. 274—11 3 Claims

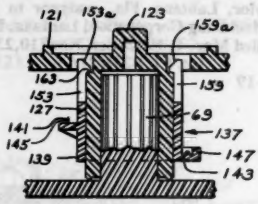


A musical selection is recorded on a first sound track driven at a speed corresponding to the frequency level of the key in which the selection is to be played. The same selection, or different harmony parts of that selection, are then successively played in different keys and are recorded on separate sound tracks at speeds corresponding respectively to the frequency or characteristic frequency of each different key selected. In each successive recording, the first recording is played back for reference purposes to provide the proper tempo for recording at each different speed. Thereafter, the recordings on each separate track are played back simultaneously at the reference speed and may be rerecorded on a single track. Although the given selection is recorded at different speeds, when played back at the reference speed each recording will blend and harmonize with the first recording. A speed changing mechanism is employed with a magnetic tape drive to carry out the method on a single tape provided with multiple sound tracks.

3,560,001
TURNTABLE AND TONE ARM MECHANISM FOR RECORD PLAYER
Jack L. Kelly, Bethel Park, Pa., and Ronald K. Wiandt, Decatur, Ill., assignors to General Electric Company, a corporation of New York
Filed Jan. 6, 1969, Ser. No. 789,248
Int. Cl. G11b 17/06
U.S. Cl. 274—15 3 Claims

In a miniature record player for reproducing diminutive records, there is provided a bifurcated tone arm, and a

plastic turntable. The tone arm has a pickup cartridge mounted on one of its free ends. The plastic turntable includes a turntable section having a pair of opposed slots formed therein adjacent the axis of rotation of the turntable. Also included in the turntable, in accordance with the present invention, is a plastic ramp element which includes a

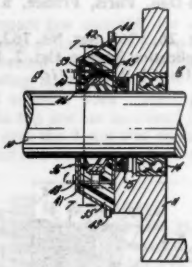


pair of opposed elongated fingers that snap into cooperation with the slots of the turntable section to secure the ramp element into aligned and contiguous relationship with the turntable section. The ramp element cooperates with the tone arm to help cam the tone arm off a record placed on the turntable at the end of each program cycle.

3,560,002
AUXILIARY OIL SEAL

Richard W. Smedley, c/o The Smedley Co., 1008 Alann Drive, Joliet, Ill. 60435

Filed July 31, 1969, Ser. No. 846,368
Int. Cl. F16j *15/32*
U.S. Cl. 277—1 **13 Claims**



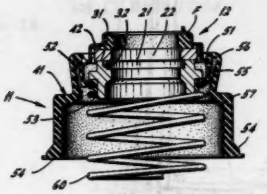
An auxiliary seal, which may be installed upon a gear box and associated shaft or similar apparatus which has developed a fluid leak through a previously installed seal is provided. A wraparound seal member is clamped into place by a circumferential clamp and a settable plastic material retains both parts in position upon the shaft adjacent the leaking seal. The settable plastic material adheres to the housing wall adjacent the shaft, but does not adhere to the shaft itself, so as to allow rotation of the shaft in the usual manner.

3,560,003
SEALS

Laurence E. Smith, Cincinnati, Ohio, assignor to Philco-Ford Corporation, Philadelphia, Pa., a corporation of Delaware

Filed Apr. 14, 1969, Ser. No. 815,826
Int. Cl. F16j *9/00, 15/40*
U.S. Cl. 277—9.5 **5 Claims**

A rotary shaft seal having precision lapped surfaces, and means for protecting these surfaces from contamination during preassembly handling. A first lapped seal ring has a flexible tubular boot attached thereto, which is provided with peripheral ridge means in such a way that "telescoping" of the boot causes a ridge to intercept a rigid flange provided on a second lapped seal ring, and thereby to press one of the lapped seal ring surfaces against the other. This arrangement

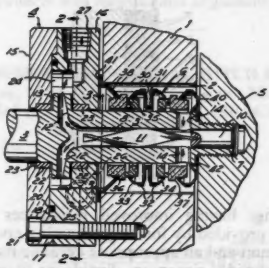


allows keeping the lapped surfaces in firm contact with one another prior to final assembly of the seal.

3,560,004
SHAFT SEAL HAVING PASSAGE FOR HEAT-TRANSFER FLUID

Philip F. Donley, Shaker Heights, and Mervil D. Chapman, South Euclid, Ohio, assignors to Ernest F. Donley Sons, Inc., Cleveland, Ohio, a corporation of Ohio

Filed Mar. 24, 1969, Ser. No. 809,692
Int. Cl. F02f *11/00;* **F16j** *15/40*
U.S. Cl. 277—22 **19 Claims**



A sealing system for a rotatable shaft, adapted to extend through a wall member or the like, wherein seal means disposed about the shaft and effective to form an essentially fluidtight enclosure between the shaft and wall member also includes a heat-transfer system positioned inwardly of the seal relative to the shaft to regulate the environmental temperature and particularly that of the seal. The heat-transfer system comprises a continuous passage of two segments of travel which are preferably consecutive. Each segment extends substantially axially of the shaft and performs a heat-transfer function. One of these segments lies along and outside of the shaft to contact it directly with the heat-transfer fluid.

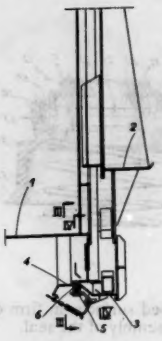
3,560,005
SEAL FOR A ROTATING CHAMBER

Rene Bovagne, Chalon-sur-Saone, France, assignor to Societe des Forges et Ateliers du Creusot, Paris, France, a company of France

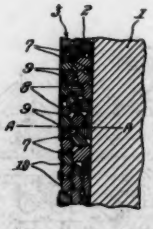
Filed June 17, 1968, Ser. No. 737,476
Claims priority, application France, June 16, 1967, 110,657
Int. Cl. F27b *7/24*
U.S. Cl. 277—147 **9 Claims**

A seal is provided between a rotating chamber and a stationary cap by providing the rotating chamber with an annu-

lar collar secured to the chamber by a partition. The stationary cap carries a sealing ring which is urged into engagement with the collar by resilient means, the ring engaging the whole periphery of the collar.

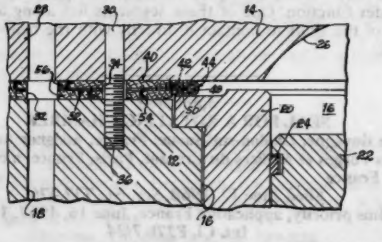


3,560,006
PISTON RINGS
Tamotsu Watanabe, Kashiwazaki-shi, Japan, assignor to Riken Piston Ring Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 12, 1968, Ser. No. 759,367
Claims priority, application Japan, Oct. 4, 1967, 42/63512
Int. Cl. F02f *5/00*; **F16j** *15/28, 9/00*
U.S. Cl. 277—235 **7 Claims**



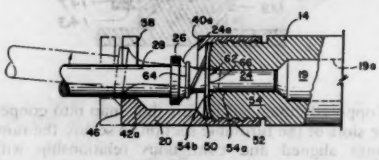
Piston rings having improved resistances to wear and scuffing are provided by forming a bearing coat of a mixture of molybdenum and an appropriate ceramic material, such as aluminum trioxide, zirconium dioxide or titanium oxide, on at least one of the bearing surfaces of the piston ring by flame spraying such mixture on the surface or on a recessed area thereof.

3,560,007
GASKET ASSEMBLY
Ramon J. Ascencio, Chicago, Ill., assignor to Felt Products Mfg. Co., a corporation of Delaware
Filed Dec. 6, 1968, Ser. No. 781,921
Int. Cl. B65d *53/00*; **F02f** *11/00*; **F16i** *15/00*
U.S. Cl. 277—235 **4 Claims**



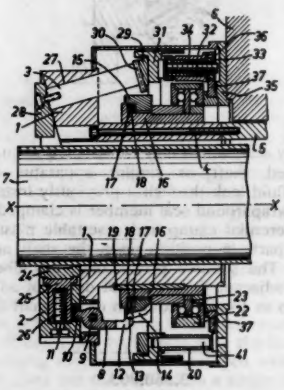
A head gasket assembly and method of assembly. A head gasket defines a combustion opening with armor in the opening and spaced from the periphery of the opening. A plurality of tabs project into the combustion opening for suspending the armor in spaced relation to the combustion opening.

3,560,008
SAFETY LOCKING TOOL HOLDER FOR PNEUMATIC HAMMER
James O. Taylor, Lantana, Fla., assignor to Florida Pneumatic Manufacturing Corporation, Lantana, Fla.
Filed Mar. 4, 1968, Ser. No. 710,235
Int. Cl. B23b *31/06*
U.S. Cl. 279—19 **8 Claims**



A safety locking holder for mounting an attachment tool onto a pneumatic hammer prevents tool removal when the holder is fully screwed onto the hammer. The holder includes a slotted collar and an open chamber portion which permit ready insertion and removal of an attachment tool when the holder is in nonlocking engagement with the hammer.

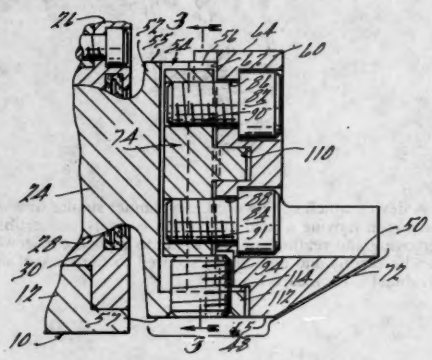
3,560,009
MACHINE-TOOL CHUCK
Pierre E. Renoux, Colombes, France, assignor to Societe anonyme dite: Cri-Dan, Paris, France, a corporation of France
Filed Sept. 26, 1968, Ser. No. 762,798
Claims priority, application France, Oct. 2, 1967, 123,019
Int. Cl. B23b *31/16*
U.S. Cl. 279—120 **6 Claims**



A machine tool chuck, as for a lathe, including chuck body having clamping means for tightly holding a workpiece. The clamping means includes a plurality of clamping jaws and a first actuating mechanism for permitting radial displacement of the jaws in a manner to compensate for eccentricity of the workpiece relative to the chuck body. Centering jaws are provided for engaging and centering the workpiece substantially within a machining zone which is spaced axially from one end of the chuck body. The centering jaws are axially withdrawn from engagement with the workpiece by a second

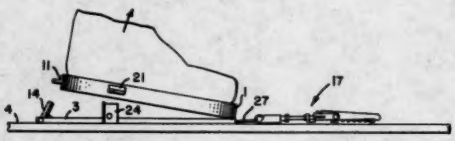
actuating mechanism after the clamping jaws engage the workpiece.

3,560,010
JAW MOUNTING FOR CHUCKS
George Hohwart, Farmington, Mich., assignor to N.A. Woodworth Company, Ferndale, Mich., a corporation of Michigan
Filed Feb. 6, 1969, Ser. No. 797,165
Int. Cl. B23b *31/10*
U.S. Cl. 279—123 6 Claims



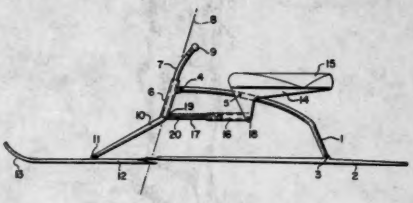
A sturdy, compact jaw assembly for work holding chucks and the like having a master jaw and a top jaw thereon, the latter being connected by suitable fastening screws to a T-nut mounted for sliding adjustment in a T-slot provided in the master jaw, and wherein work clamping and holding forces on the face of the top jaw are sustained jointly by a cross-key on and integral with the T-nut and an adjusting screw in the master jaw behind and bearing on the T-nut.

3,560,011
SAFETY BINDING MECHANISM
Richard G. Spademan, 933 Addison Ave., Palo Alto, Calif.
Filed Oct. 22, 1968, Ser. No. 769,628
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 6 Claims



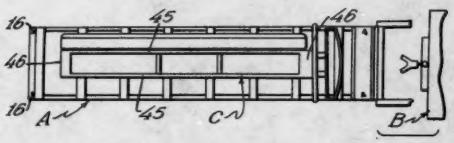
An improved stability safety binding of the type in which all degrees of movement of a ski boot relative to a ski are releasably resisted without requiring the use of a toe fastening device. A unitary safety release mechanism spring-biases upwardly and inwardly directed clamping arms into engagement with flanges at the sides and rear of the ski boot. The rear clamp resists rearward longitudinal movement of the boot, and the side clamps are inclined in an outwardly and rearwardly direction to resist forward longitudinal movement of the boot.

3,560,012
SKI-BOB
Josef Auer, Worgl, Tirol, Austria
Filed Dec. 5, 1968, Ser. No. 781,526
Claims priority, application Austria, Dec. 15, 1967, July 26, 1968, 11315/67;7268/68
Int. Cl. B62b *13/04*
U.S. Cl. 280—16 9 Claims



A vehicle combining features of skis and of a bobsleigh in which a normally upright frame carrying a seat for rider is equipped with a ski-like front runner and a similar rear runner, the front runner being mounted on a steering column. A universal pivot assembly located closely adjacent the axis of the steering column connects the rear end of the front runner to the front end of the rear runner. The steering column is attached to the frame by means of a bearing which pivots in the longitudinal upright plane of the frame and is hingedly linked to the hingedly mounted seat so that the weight of the rider tends to pivot the bearing in a direction to draw the two runners into longitudinal alignment.

3,560,013
SNOWMOBILE-TOBOGGAN HITCH KIT
Lawrence J. Lee, 1410 Ames Ave., Saint Paul, Minn. 55106
Filed Apr. 29, 1969, Ser. No. 820,063
Int. Cl. B62b *13/00*
U.S. Cl. 280—19 6 Claims



This invention relates to a toboggan kit used to provide a means of attaching a toboggan to a snowmobile. The kit includes reinforcing plates which extend inside and outside the curved front end of the toboggan and are bolted together. A hitch is hingedly connected to the reinforcing plates by a transverse horizontal axis and extends forwardly for attachment with the snowmobile. Preferably a seat is mounted along the longitudinal center of the toboggan to be straddled by the occupants. A windshield is also preferably provided at the front end of the seat.

3,560,014
SKI POLE PROVIDED WITH HAND LOOP
Franz Xaver Bruckl, Krottenkopfstrasse 50, Eschenlohe, Germany
Filed Aug. 12, 1968, Ser. No. 751,854
Claims priority, application Germany, Aug. 17, 1967, P 15 78 728.7; Austria, Mar. 15, 1968, A 2597/68
Int. Cl. A63c *11/22*
U.S. Cl. 280—11.37 3 Claims

An adjustable hand loop is secured to the grip of a ski

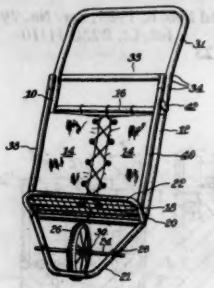
pole. The belt of the hand loop is held by fastening and adjusting means, which are provided on the transverse top face of the ski pole grip and of the ski pole.

3,560,015

COMBINED WHEEL AND PACK CARRIER

Lee J. Tracy; Jesse L. Tracy, and David S. Tracy, 629 8th St., Ogden, Utah 84404

Filed June 28, 1968, Ser. No. 740,924
Int. Cl. B62b 1/12
U.S. Cl. 280—47.3 3 Claims



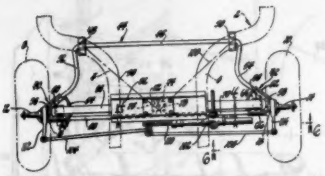
A device which can be used in a manner similar to a wheel barrow in moving a load and which is easily convertible by removing and reattaching the wheel to a pack carrier which can be readily and detachably secured to the back of an individual for pack carrying.

3,560,016

DIRIGIBLE WHEEL SUSPENSION INCLUDING MEANS FOR INDUCING LATERAL ACCELERATION RESPONSE UNDERSTEER

Ronald T. Bundorf, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed June 11, 1968, Ser. No. 736,157
Int. Cl. B60g 3/10
U.S. Cl. 280—96.2 2 Claims



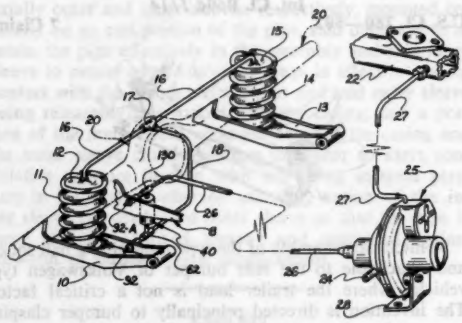
A dirigible wheel suspension for vehicles in which transversely oppositely directed wheel deflection control arms are connected to the vehicle superstructure by pivot means permitting yieldable lateral translation of the wheels relative to the vehicle sprung mass responsive to centrifugal force acting on the vehicle. A steering mechanism mounted in a fixed position on the vehicle operatively engages the wheels via steering linkage connected to the wheels forwardly of their axis of dirigible movement so that a given steering angle of the wheels imposed by the steering mechanism progressively decreases as centrifugal force acting on the vehicle increases.

3,560,017

CONTROL APPARATUS FOR VEHICLE SUSPENSIONS

Arthur E. Vogel and Palmer Fultz, Columbus, Ohio, assignors of twenty-five percent each to Robert T. Dawson, Coshocton, Ohio, and Warren H. F. Schmieding, Mount Helix, La Mesa, Calif.

Continuation of application Ser. No. 579,644, Sept. 15, 1966. This application Nov. 5, 1969, Ser. No. 871,565
Int. Cl. B60g 15/08
U.S. Cl. 280—124 35 Claims



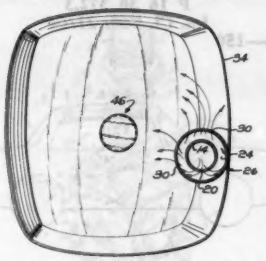
A control system for vehicle suspensions of the type that include sprung and unsprung weight portions, air chambers operative between the weight portions and an air compressor for delivering pressurized air to said chambers. The system is further characterized by the compressor being stallable at predetermined pressures selected for the air chambers by a height control valve means mounted on one of said weight portions. The present application further relates to a novel height control valve for use in controlled suspension systems such as the one described above.

3,560,018

VEHICLE SAFETY APPARATUS

George W. Goetz, Detroit, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio, a corporation of Ohio

Filed July 31, 1968, Ser. No. 749,063
Int. Cl. B60r 21/00
U.S. Cl. 280—150 4 Claims



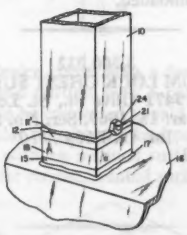
A safety apparatus includes a reservoir containing fluid under pressure, means for opening the reservoir upon the occurrence of a collision, a diffuser for directing the flow of fluid from the reservoir, and a confinement adapted to be inflated from a collapsed condition to an expanded condition in which the confinement is operative to restrain an occupant of a vehicle against movement resulting from a collision. The relationship between the diffuser and the reservoir is such as to result in a directing of the flow of fluid from the reservoir without an undue restriction of the flow. The pressure-volume relationship between the fluid in the reservoir and the fluid in the inflated confinement is such as to provide sufficient fluid for inflating the confinement and absorbing the kinetic energy of an occupant engaging the inflated confinement during the collision.

3,560,019

SHOCK CUSHIONING MOUNTING MEANS FOR CANOPIES ON HEAVY EQUIPMENT

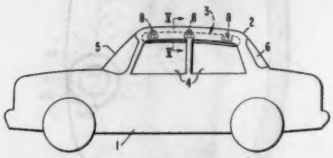
James C. Moore, Portland, Oreg., assignor to Portland Wire & Iron Works, Portland, Oreg., a corporation of Oregon

Filed May 22, 1969, Ser. No. 826,895
Int. Cl. B62 25/06
U.S. Cl. 280—150 6 Claims



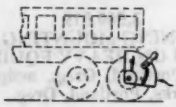
A mount including cooperating portions, one a bayonet member with a protruding body of decreasing cross-sectional area and the other a sleeve member having a correspondingly decreasing internal cross-sectional area capable of receiving the bayonet body in a close fit; one portion secured to the bottom of the canopy post and the other portion secured to the vehicle; a cushioning element normally maintaining a slight overall clearance between bayonet body and the surrounding sleeve wall; and locking means preventing any greater separation between bayonet body and sleeve than normally caused by the cushioning element.

3,560,020
TEMPLE PROTECTION, ESPECIALLY FOR PASSENGER MOTOR VEHICLES
Bela Barenyi, Stuttgart-Vaihingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed Oct. 17, 1968, Ser. No. 768,394
Claims priority, application Germany, Oct. 20, 1967, P 16 30 372.3
Int. Cl. B60r *21/04*
U.S. Cl. 280—150 30 Claims



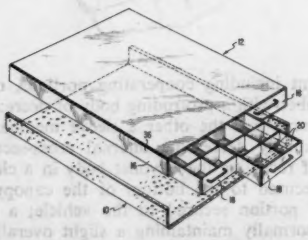
A temple protection for increasing the interior safety of a passenger space formed by a closed vehicle body, especially of passenger motor vehicles, in which a preferably padded rail is mounted within the area of the upper edge of the side windows and/or door apertures that extends essentially from the windshield to the rear window; the rail is secured at the vehicle body or at the lateral roof bearer with a spacing to the lateral wall by means of deformation members.

3,560,021
MUDGUARDS
William W. Watson, 4912 W. Jerelyn Place, Milwaukee, Wis. 53219
Continuation-in-part of application Ser. No. 786,999, Dec. 26, 1968. This application Aug. 19, 1969, Ser. No. 851,415
Int. Cl. B62d *25/16*
U.S. Cl. 280—154.5 11 Claims



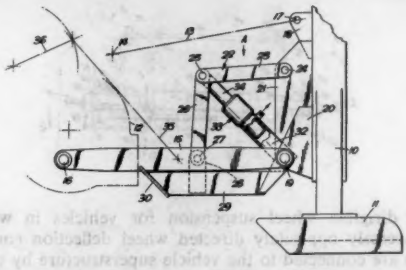
A mudguard for the rear wheels of dump trucks. The mudguard is pivotally mounted to enable moving it when the truck is being unloaded.

3,560,022
VACUUM LOCK CHEST SUPPORT
Dwight B. Gold, 9471 Olive St., St. Louis, Mo. 63132
Filed Mar. 18, 1969, Ser. No. 808,121
Int. Cl. B60p *7/10*
U.S. Cl. 280—179 2 Claims



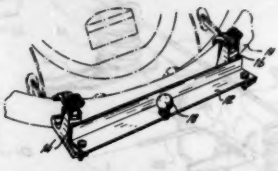
A thin sheet of polyurethane is completely compressed between an overlying chest and an underlying support surface to create a "vacuum lock" coupling therebetween.

3,560,023
GROUND ENGAGING IMPLEMENT SUPPORTS FOR ATTACHMENT TO TRACTORS
Harry William Norton and Ian Robertson, Ludlow, England, assignors to F. W. McConnell Limited, Ludlow, England, a British company
Filed Feb. 28, 1969, Ser. No. 803,362
Claims priority, application Great Britain, Mar. 1, 1968, 10,134/68
Int. Cl. B60s *9/10*
U.S. Cl. 280—475 7 Claims



A ground engaging support for attachment to a tractor comprises a support structure on which an implement may be mounted, which support structure is adapted for attachment to a tractor by means of pivotal connections between the support structure and upper and lower links extending rearwardly on the tractor, so that the support structure may be brought into and out of contact with the ground by swinging the links. A subsidiary pivoted linkage is connected between the support structure and at least one of the links an hydraulic ram being provided to deform the subsidiary linkage in a manner to impart a downward load to the support structure when it is in engagement with the ground.

3,560,024
SMALL CAR HITCH BAR ASSEMBLY
John C. Abromavage, Tempe, and James W. Ryden, Phoenix, Ariz., assignors to Arcoa, Inc., Phoenix, Ariz., a corporation of Oregon
Filed June 25, 1969, Ser. No. 836,235
Int. Cl. B60d *1/14*
U.S. Cl. 280—502 7 Claims

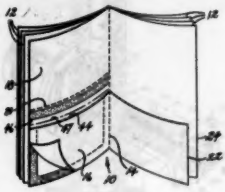


A hitch bar assembly of the type mounting a ball socket and attachable to the rear bumper of Volkswagen type vehicles where the trailer load is not a critical factor. The invention is directed principally to bumper clasping compressive elements mounted at both ends of the hitch bar.

3,560,025
INSERT FOR BOOKS AND THE LIKE AND METHOD FOR MAKING SAME
Richmond V. Ostrander, Waukegan, Ill., assignor to United States Envelope Company, Springfield, Mass., a corporation of Massachusetts
Filed Aug. 28, 1968, Ser. No. 756,053
Int. Cl. B42d *1/00*
U.S. Cl. 281—3 2 Claims

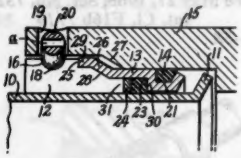
An insert for binding in books and the like made from folded sheet material and having two panels folded into

face-to-face relation along a horizontal fold line and divided into two pages by a vertical line of weakening. Portions of the panels which form one of the pages are connected in face-to-face relation by a generally U-shaped line of adhesive to form a removable envelope. After the insert is bound in a book it is trimmed to size, along with



the other pages of the book, by cutting along its unbound edges. This does not effect the envelope appearing on the first page as the line of glue maintains the desired connection between the two overlying panels, but as to the second page it does disconnect the two panels and forms one of them into a removal coupon or the like.

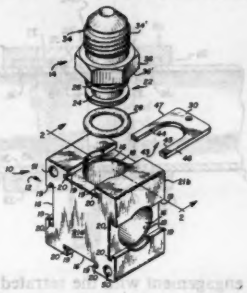
3,560,026
COUPLING ASSEMBLY
Homer D. Roe, 8 Chapin Place, Huntington, N.Y. 11743
Filed Apr. 30, 1969, Ser. No. 820,568
Int. Cl. F16l *17/02*
U.S. Cl. 285—105 **2 Claims**



A coupling assembly releasably connected to a pipe or tube in a conduit system has a casing which encloses axially outer and inner sleeves, respectively, mounted coaxially on an end portion of the pipe, said outer sleeve to retain the pipe effectively in the assembly and said inner sleeve to retain outer and inner rings in effective sealing contact with the casing and the pipe and said outer sleeve being releasably interlocked with the casing; and a portion of the inner sleeve arranged between the casing and the outer sleeve closely engages the latter to exert constrictive pressure thereon with increasing internal pressure in the system whereby camming action of the inner sleeve constricts said outer sleeve so that the pipe is more securely clamped thereby and restrained against blow-out or outward axial displacement.

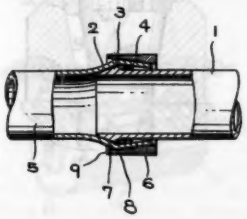
3,560,027
COUPLING ASSEMBLY
Charles H. Graham, Mountain View, Calif., assignor to Gra-Tec, Inc., Los Altos, Calif., a corporation of California
Continuation of application Ser. No. 515,848, Dec. 23, 1965, which is a continuation-in-part of application Ser. No. 432,598, Feb. 15, 1965. This application Feb. 20, 1967, Ser. No. 617,145
Int. Cl. F16l *41/00*
U.S. Cl. 285—150 **8 Claims**

The coupling assembly disclosed herein comprises a distribution block and associated fitting terminations sealably connected with the block. The distribution block is provided with a plurality of intersecting smooth bores extending thereinto from the sides thereof to provide a plurality of ports and a corresponding number of slots, each intersecting one of the bores adjacent a port. Each of the fitting terminations includes a cylindrical surface portion having a pair of axially spaced annular grooves and slidably received within the associated bore, and a shoulder



portion abutting a block side surface when the termination is positioned within the bore with the outer annular groove aligned with an associated slot. A clip slides within the slot and a portion of that outer groove and a resilient O-ring is positioned within the other groove, respectively, to lock and seal the block and termination together.

3,560,028
PIPE JOINT DEVICE
Manabu Ohba, Aichi, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Filed Dec. 30, 1968, Ser. No. 787,796
Claims priority, application Japan, Jan. 19, 1968, 43/3,262
Int. Cl. F16l *33/22*
U.S. Cl. 285—255 **1 Claim**

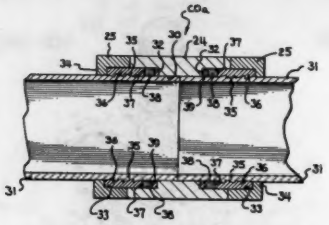


A pipe joint device comprising a first tubular member formed on one end portion with a protrusion, a second tubular member to be connected to said first tubular member, and an annular member formed on its inner circumferential surface with an inclined surface which is to be fitted over the outer circumferential surface of said second tubular member.

3,560,029
CONNECTION MEANS FOR WAVE GUIDE MEANS
Edwin Floyd, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of application Ser. No. 670,732, Sept. 26, 1967, which is a continuation-in-part of application Ser. No. 631,841, Apr. 18, 1967, which in turn is a continuation of application Ser. No. 468,793, July 1, 1965. This application Sept. 22, 1969, Ser. No. 865,229
Int. Cl. F16l *19/02*
U.S. Cl. 285—369 **7 Claims**

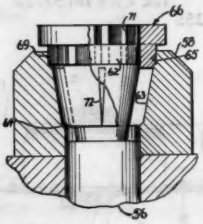
A wave guide connector for connection onto an end of a wave guide comprises a body member having an open-

ing extending therethrough with the opening having a configuration corresponding to the cross-sectional configuration of the wave guide. The end of the wave guide fits into the opening of the body member and is provided with serrated areas. Serrated inserts are disposed in the



opening in engagement with the serrated areas and means is removably secured onto the body member and in engagement with the serrated inserts thereby securing the inserts and the end of the wave guide in the opening of the body member.

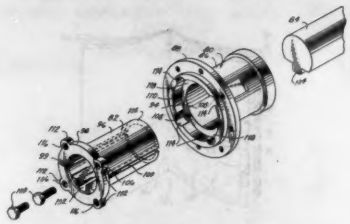
3,560,030
CLOSURES
Fred Macks, 8 Willow Lane, Vermilion, Ohio 44089, and Harold Gold, 3645 Holland Road, Shaker Heights, Ohio 44122
Filed May 11, 1967, Ser. No. 637,663
Int. Cl. B25g *3/28*
U.S. Cl. 287—20.3 **7 Claims**



This invention relates to closures and fastening devices that can be used to plug entrance holes in manifolds and the like, to anchor stud, shaft and tube members in holes in a body, and to anchor tube, cap or wheel members to a shaft of the like. The invention provides means for obtaining dovetail-like locks between the sealing or anchoring members, whereby internal pressure or ejecting force causes the sealing contact stress or the pull-out resistance to increase.

3,560,031
COMPRESSIBLE DUAL AXLE MOUNT
James Gilmour, Jr., Rte. 2, Aurora, Ill.
Continuation-in-part of application Ser. No. 610,606, Jan. 20, 1967. This application Dec. 2, 1968, Ser. No. 780,366
Int. Cl. B60b *27/06*
U.S. Cl. 287—52.06 **5 Claims**

A mount for adding an additional wheel to a tractor comprising a hub with an integral wheel supporting end plate and a removable insert clamped between the tractor's axle and the hub. In a first embodiment, the hub is U-shaped and the inserts are bolted both to the tractor's axle and to the hub. In a second embodiment, the hub



is annular and the insert comprises a tapered sleeve that is wedged between the tractor's axle and the hub. In both embodiments the inserts may be interchanged with other inserts allowing the hub to be mounted on axles of different diameters.

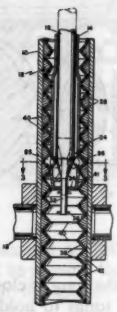
3,560,032
ADJUSTABLE CLUTCH FOR RELATIVELY MOVING TUBULAR PARTS
Abraham B. Cohen, Syosset, N.Y., and Melvin L. Freeman, Edmond, Okla., assignors to LTV Ling Altec, Inc., Oklahoma City, Okla., a corporation of Delaware
Filed May 27, 1968, Ser. No. 732,464
Int. Cl. F16b *7/14*
U.S. Cl. 287—58 **5 Claims**

A clutch which is adjusted by selectively spreading fingers attached to one end of an elongated element telescoped within a tube, the adjustment being effected and maintained by a bolt whose head turns against wedge-shaped fingers and a compression spring that constantly urges the fingers outward into contact with the tube.

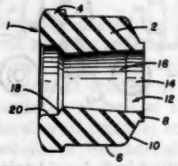
3,560,033
TELESCOPIC POSITIVE LOCK STRUT
Homer A. Barkus, 2621 University Ave., San Diego, Calif. 92104
Filed Feb. 25, 1969, Ser. No. 802,169
Int. Cl. F16b *7/10*
U.S. Cl. 287—58 **3 Claims**

The strut is adaptable to chairs, tables, stands for microphones, lamps and the like, and many other uses for which telescopic struts are required. A fully enclosed wedge and ball type mechanism provides positive locking at any of a large number of different positions, and means is included to retain the strut at any selected

locked position. A simple release mechanism permits rapid adjustment and, if the locking mechanism is not properly engaged, application of load on the strut will complete the locking action without danger of slippage.



3,560,034
FLANGED-END BUSHING
Gary L. Hipsher, Logansport, Ind., and Robert D. Vosburgh, Utica, Mich., assignors to The General Tire & Rubber Company, a corporation of Ohio
Continuation of application Ser. No. 732,365, May 27, 1968. This application May 28, 1969, Ser. No. 828,599
Int. Cl. F16f 1/38
U.S. Cl. 287—85 6 Claims

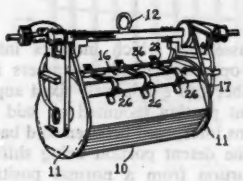


An improved flanged-end resilient bushing of the type used, for example, as an isolation mounting in automobile suspensions, comprises an annular elastomeric insert radially compressed between a pair of rigid concentric sleeves. The elastomeric insert is composed of a flange and a body portion. Longer bushing life is achieved by molding the insert with the bore through the body portion having at least about a 2° taper, extending from a smaller diameter at the junction with the flange to a larger diameter at the free end of the body portion opposite the flange.

3,560,035
UNIVERSAL JOINT CONSTRUCTION
Georg Kindel, Lemforde, Hannover, Germany, assignor to Lemforder Metallwaren AG, Lemforde, Hannover, Germany
Filed Jan. 17, 1968, Ser. No. 698,636
Claims priority, application Germany, Jan. 19, 1967, L 55,522
Int. Cl. F16c 11/06
U.S. Cl. 287—90 6 Claims

The construction of a ball and socket joint, particularly for the articulation of wheels of an automobile suspension system, includes a bearing shell construction which is arranged within an outer housing to provide a universal pivotal support for a ball portion of a journal pin. The bearing shell includes an annular projecting portion and a resilient cover member is engaged over the annular projecting portion and held within an annular recess defined in the outer housing. Automatic adjustment of the joint is effected by a spring element which is formed by the bearing shell itself. For this purpose, the bearing shell is advantageously made of a single hard plastic material which either includes a separate spring-like element formed therein or is formed of a material such that it provides an inward loading effect on the ball portion of the joint pin. To produce this action in accordance with the invention, the shell is formed such that it has an inwardly extending curvature as compared to the curvature of the ball head of the joint pin.

3,560,036
LATCH FOR THE COVER OF AN ELECTRICAL PLATING ROTATING BARREL
Walter F. Kiefer and Richard G. Stutz, Chicago, Ill., assignors to The Stutz Company, Chicago, Ill., a corporation of Illinois
Filed Aug. 25, 1969, Ser. No. 852,828
Int. Cl. E05c 19/06
U.S. Cl. 292—87 2 Claims

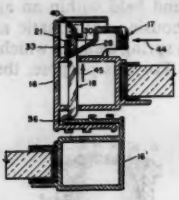


A latch for the cover of an electrical plating rotating barrel in which the latch (of which there is one or more) comprises a latch finger pivotally connected to the cover for removal therewith when the cover is removed from the cover opening in the barrel, the latch having a keeper head adapted to snap over and onto a latch bar provided by the barrel along the edge of the cover opening thereof.

3,560,037
SLIDING WINDOW LATCH
Philip Crain, Valley Stream, N.Y., assignor to Allen-Stevens Corp., Woodside, N.Y., a corporation of New York
Filed July 28, 1969, Ser. No. 845,327
Int. Cl. E05c 1/16, 7/02
U.S. Cl. 292—170 9 Claims

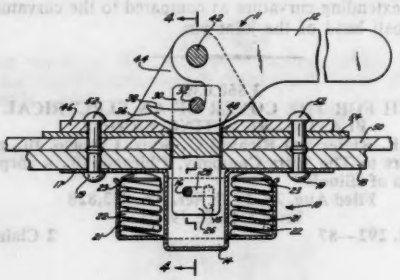
A latch for sliding windows which consists of a latching element having an extended flange at one end and an actuator comprising a guide member which slides within an aperature in the latching element. Camming surfaces

provided on the actuator engage the flange extensions and translate the latching element in a direction normal to



the direction of movement of the actuator. A spring affixed to the latching element flange is held in compression by a housing member.

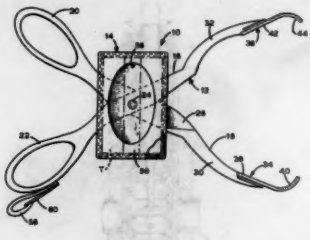
3,560,038
LEVER ACTUATED FASTENER ASSEMBLY
Conrad J. Gunther, Uniondale, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y., a corporation of New York
Filed Dec. 18, 1968, Ser. No. 784,578
Int. Cl. E05c *3/04*
U.S. Cl. 292—241 **3 Claims**



A fastener assembly which includes interengageable receptacle and operating handle members in which the receptacle member has a relatively fixed supporting base portion, a detent portion mounted on said base portion and spring means interposed between said base and detent portions with the detent portion being shiftable relative to the base portion from a normal position with the spring means being relatively expanded to a position where the spring means is relatively contracted. The operating handle member is in turn provided with an operating lever portion shiftable between open and closed positions and also with a cam portion projecting therefrom for engaging the detent portion when the lever is in open position with the detent portion being in relatively spring expanded position whereby when the operating lever is thereafter shifted to closed position the detent portion is in turn shifted to relatively spring contracted position thereby holding the assembly in closed or locked position and under spring tension.

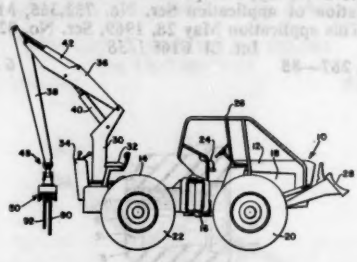
3,560,039
SANITATION DEVICE
Jack Gruber, 280 Prospect Ave., Hackensack, N.J. 07601
Filed Dec. 6, 1968, Ser. No. 781,937
Int. Cl. A47j *45/10*; B25b *7/00*
U.S. Cl. 294—16 **5 Claims**

Apparatus for handling and disposing of animal excrement and the like comprising a pair of tongs having transverse elongated scoop portions connected to the end of each lever which curves concavely inwardly toward the opposite lever so that the scoop portions form a



closed-end scoop when the tong is closed. Tissue retaining means mounted on the tongs to hold a packet of tissues for use in handling the excrement.

3,560,040
GRAPPLE
Welker W. Funk, Moline, Ill., assignor to Deere & Company, Moline, Ill., a corporation of Delaware
Filed July 16, 1968, Ser. No. 745,222
Int. Cl. B66c *1/00*
U.S. Cl. 294—97 **5 Claims**

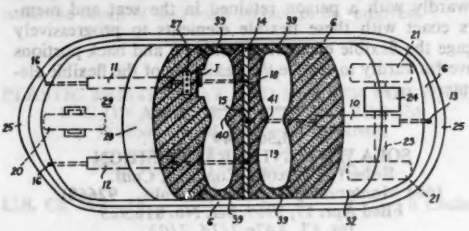


A grapple device that includes a horizontally elongated housing supporting a pair of depending grapple tines and encasing a pair of horizontal cylinders that extend in side-by-side disposition with one of the cylinders operating to move one tine and the other cylinder operating to move the other tine. The housing structure is supported on an end of a boom by a universal joint that has rubber bushings contained therein that frictionally engage cylindrical walls or surfaces of the universal joint so as to dampen and to resist swinging of the grapple structure on the boom.

3,560,041
AUTOMOBILE ROAD VEHICLES
David B. Foster, White House, Sunninghill Road, Windlesham, Surrey, England
Filed Feb. 19, 1968, Ser. No. 706,335
Claims priority, application Great Britain, Feb. 20, 1967, 8,022/67
Int. Cl. B62d *39/00*
U.S. Cl. 296—1 **2 Claims**

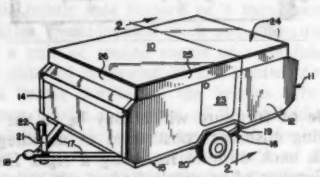
A vehicle comprising a mounting chassis, a driver/passenger compartment formed as an assembly separate from said mounting chassis, and shock-absorbing means connected between said mounting chassis and said compartment whereby said compartment can move longitudinally with respect to said mounting chassis. The driver/passenger compartment is provided with interior padding

surrounding the occupants from head to feet with the padding being provided with openings therethrough at the locations of the glazed areas of the vehicle body, said



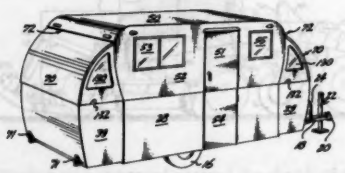
padding also being shaped to follow the profile of the seated occupants and to prevent the occupants from coming into contact with the glazed areas in the event of collision.

3,560,042
TRAVEL TRAILER CONSTRUCTION
James F. McCarthy, Brookfield, Ill., assignor to Free Winds, Inc., a corporation of Illinois
Filed Oct. 14, 1968, Ser. No. 767,343
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 **12 Claims**



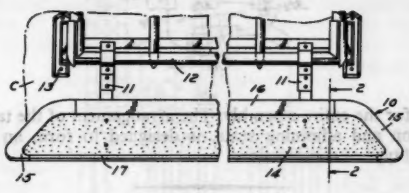
A trailer construction adapted to be attached to and drawn rearwardly of a motor vehicle when in a relatively compact condition and which is capable, when unhitched or detached from the draft vehicle, of being quickly and easily expanded vertically as well as fore and aft by the interaction of a plurality of foldable and slidable solid or rigid panels to provide a weathertight and waterproof enclosure of relatively large interior dimensions suitable for living quarters.

3,560,043
EXPANDABLE HOUSE STRUCTURE
Kenneth R. Harter, 6406 S. 143rd St., Seattle, Wash. 98104
Filed May 12, 1969, Ser. No. 823,862
Int. Cl. B60p *3/34*
U.S. Cl. 296—27 **5 Claims**



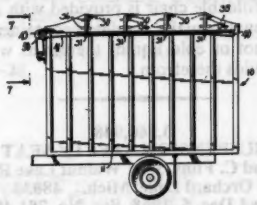
A housing unit is provided which is capable of being expanded from a compact condition desirable for mobility by vertical movement of a roof section relative a main frame section and by substantially simultaneous longitudinal extension of at least one end section outward of the other sections.

3,560,044
AUTOMOBILE WIND DEFLECTOR
Frederick A. Helm, Detroit, Mich., assignor to Helm Design & Manufacturing, Inc., Detroit, Mich., a corporation of Michigan
Filed Apr. 30, 1969, Ser. No. 820,579
Int. Cl. B60j *1/20*
U.S. Cl. 296—91 **10 Claims**



A wind deflector mounted adjacent the rear window of an automobile and comprising a longitudinally extending member with upper and lower edges which is made of a sheet of stainless material. The outer surface of the sheet has a satin finish and the inner surface of the sheet is polished. The upper and lower edges are bent inwardly over the satin finish to provide longitudinally extending ribs that have their exterior surfaces polished.

3,560,045
FLEXIBLE COVER POSITIONING APPARATUS
Erwin F. Finneman, Rte. 1, Box 25, Anamoose, N. Dak. 58710
Filed Mar. 21, 1969, Ser. No. 809,269
Int. Cl. B60j *7/10*
U.S. Cl. 296—137 **4 Claims**

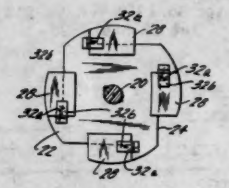


A downwardly opening track affixed to the upper edges of opposed sides of a truck box with a plurality of dollies movably engaged therewith, a plurality of support rods having a flexible cover attached thereto affixed to a dolly at either end thereof, an endless flexible cable mounted by pulley means adjacent each end of at least one of the tracks and affixed to the rear dolly engaged in said track, and an electric motor engaged with the pulley means for moving the endless cable for stretching or retracting said flexible cover over the box.

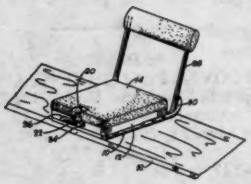
3,560,046
INTEGRAL TABLE AND SEATING ARRANGEMENT
Jeffrey Owen Brosk, 150 E. 69th St., New York, N.Y. 10005
Filed Sept. 26, 1968, Ser. No. 762,709
Int. Cl. A47b *25/00*
U.S. Cl. 297—157 **8 Claims**

An integral table and seating arrangement in which a number of seats together with back rests are situated about a table portion supported at its center. The support

for the table portion is in the form of a vertical post extending to a base resting on the floor. The base extends over sufficient area on the floor to provide a stable support for the entire assembly. The arrangement of the table portion and adjoining seats, is designed to form an integral type of construction.

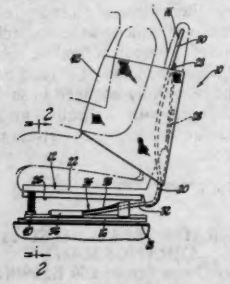


3,560,047
FOLDABLE PORTABLE CHAIR WITH LIQUID DISPENSER
John W. Davis, 1200 La Cruz Drive, El Paso, Tex. 79902
Filed June 25, 1969, Ser. No. 836,284
Int. Cl. A47c *7/62*
U.S. Cl. 297—188 **5 Claims**



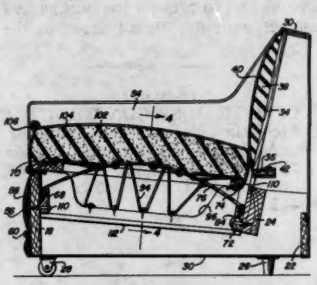
A portable foldable chair is provided with a seat having therein a hollow thermally insulated container with means to introduce hot or cold liquids therein as well as means to dispense liquids therefrom.

3,560,048
SUSPENSION SAFETY SEAT
Hyland C. Flint, 3551 Walnut Lake Road, Orchard Lake, Mich. 48033
Filed Dec. 5, 1968, Ser. No. 781,406
Int. Cl. A62b *35/60*
U.S. Cl. 297—389 **9 Claims**



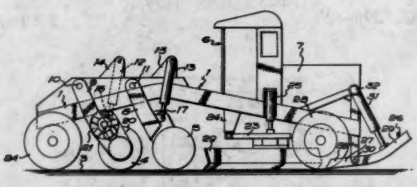
A seat assembly of the type utilized in vehicles including a seat portion and a back portion with a restraining means such as a seat belt, vest, or the like, attached to the seat portion or back portion for retaining a person in the seat assembly. A pair of flexible wire-like elements are connected to a base and extend rearwardly and upwardly therefrom to support the seat and back portion. These flexible elements allow the seat and back portions to move forwardly with a person retained in the seat and members coact with these flexible elements to progressively engage the flexible elements as the seat and back portions move forwardly to reduce the flexibility of the flexible elements.

3,560,049
SOFA WITH INTEGRAL CUSHION
Robert E. Burton, Coalinga, Calif. (464 Montgomery St., Orange, Calif. 92668)
Filed Apr. 17, 1969, Ser. No. 816,925
Int. Cl. A47c *7/14, 7/02*
U.S. Cl. 297—452 **8 Claims**



An article of furniture which may be in the form of a sofa having cushions constructed as an integral part thereof with each cushion including a rigid framework having a plurality of arcuately bowed serpentine springs with resilient adjustment straps attached thereto. The end springs have stabilizing tie cords and interconnecting coil spring are provided for stabilizing the arcuate spring members.

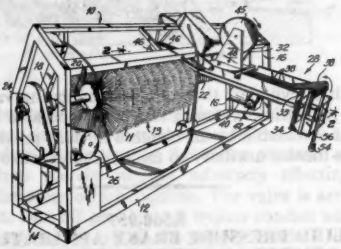
3,560,050
MACHINES FOR REMOVING WORN ROAD SURFACES
Peter Lockwood, Darlington, England, assignor to Greenside Machine Company Limited
Filed Feb. 24, 1969, Ser. No. 801,548
Claims priority, application Great Britain, Mar. 20, 1968, 13,430/68; July 16, 1968, 33,811/68
Int. Cl. E01c *23/09*
U.S. Cl. 299—39 **5 Claims**



Apparatus for removing a worn road surface down to a predetermined depth prior to the application of a new surface, comprises a chassis support means for the chassis in the form of road wheels or tracks means to displace said chassis in a forward and/or reverse direction, a pick-carrying hydraulically driven cutting drum supported from said chassis and located within said support

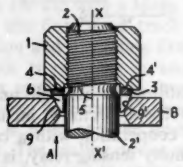
means thereof and rotatable in the same direction as the road wheels about a horizontal axis at an angle to the longitudinal axis of said chassis, and means to adjust said cutting device in a substantially vertical plane to determine the depth of said road surface to be removed.

3,560,051
PLASTIC BRISTLE MAT AND HOLDER FOR WINDING ON A STREET SWEEPING BROOM
William Gould, 93 Sagamore Road, Millburn, N.J. 07041
Filed July 17, 1968, Ser. No. 745,429
Int. Cl. A46d *9/00*
U.S. Cl. 300—14 **8 Claims**



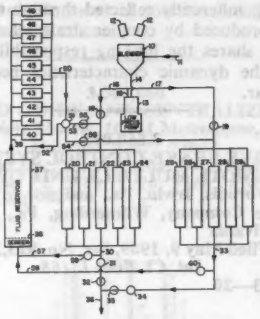
A plastic bristle mat formed of a succession of individual bristles, multi-layered thick and interconnected by means of a pair of spaced seams of a flexible filament or thread stitched crosswise to the bristles on opposite sides of a center portion of the bristles. The stitching allows some relative movement of the individual bristles and bendability of the mat transverse to the longitudinal axis of the mat. A predetermined length of the mat is stored in a storage container which is removably mounted adjacent a feed conveyor and the mat is uniformly fed from the container automatically into a core, which could have various configurations. The core is disposed about a shaft to form a broom. The container moves with the conveyor.

3,560,052
DEVICES FOR MOUNTING VEHICLE WHEELS
Henri Verdier, Beauregard-l'Eveque, Puy-de-Dome, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, Puy-de-Dome, France
Filed Oct. 14, 1968, Ser. No. 767,302
Claim priority, application France, Oct. 17, 1967, 124,804
Int. Cl. B60b *3/16*
U.S. Cl. 301—9 **2 Claims**



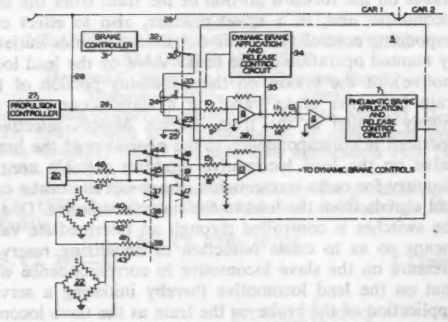
A centering ring mounted around the shank of a vehicle-wheel bolt and gripped between the wheel and a nut has a continuous annular surface in contact with the nut. The ring is nevertheless sufficiently elastic, by virtue of at least one partial slot or by means of a bore selected in such a manner as to leave with the shank of the bolt a sufficiently small clearance, to grip the shank of the bolt when the nut is tightened.

3,560,053
HIGH PRESSURE PUMPING SYSTEM
John E. Ortloff, Houston, Tex., assignor to Esso Production Research Company, a corporation of Delaware
Filed Nov. 19, 1968, Ser. No. 776,949
Int. Cl. B65g *53/30*
U.S. Cl. 302—14 **4 Claims**



A system for pumping a hydraulic fracturing fluid or similar liquid containing suspended solids at high pressure wherein the solids-laden fluid is charged into an accumulator at low pressure and then displaced from the accumulator at high pressure without passing through the high pressure pumping equipment.

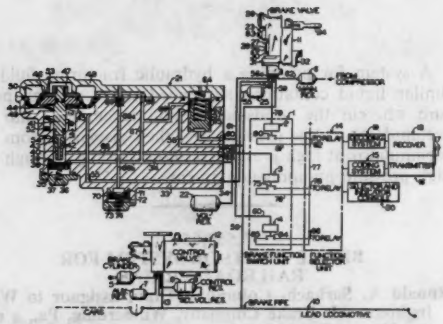
3,560,054
BRAKE CONTROL SYSTEM FOR RAILROAD TRAINS
Ronald A. Sarbach, Columbus, Ohio, assignor to Westinghouse Air Brake Company, Wilmerding, Pa., a corporation of Pennsylvania
Filed Apr. 22, 1969, Ser. No. 818,334
Int. Cl. B60t *13/68*
U.S. Cl. 303—20 **13 Claims**



An electronic brake control system for railway trains in which strain sensors monitor buff and draft coupler forces existing between adjacent cars in the train consist to establish a brake control signal at the trailing one of the cars. The analog polarity signal produced in accordance with the degree and character of coupler strain establishes control of the vehicle brakes, the effectiveness of which control is varied by a consequent change in coupler force as the vehicle brake controls attempt to arrive at a condition of brake effort where coupler forces are balanced. The

head-end car in the train consist establishes the reference rate of retardation on the consist to which the trailing car brake controls adhere. Rate feedback means on the head-end car constrains its brake controls to maintain a linear and repeatable retardation rate in accordance with the level of brake request signal. Blending of friction and dynamic brake control is obtained on the head-end car with other variable dynamic conditions effective on each trailing car being inherently reflected through the brake control signal produced by coupler strain whereby each car in the train shares the braking responsibility in accordance with the dynamic characteristics peculiar to that particular car.

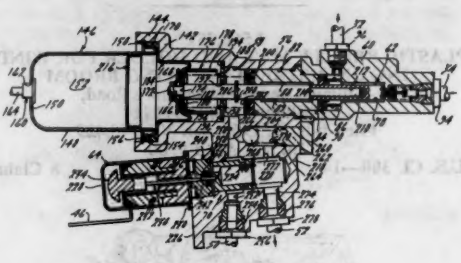
3,560,055
LOCOMOTIVE BRAKE CONTROL SYSTEM SUITED FOR REMOTE MULTIPLE UNIT OPERATOR
Robert J. Worbois, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa., a corporation of Pennsylvania
Filed May 9, 1969, Ser. No. 823,307
Int. Cl. B60t *13/68*
U.S. Cl. 303—20 **9 Claims**



Brake control apparatus for the lead locomotive of a multiple unit locomotive control system wherein the brake valve on the lead locomotive is manually operable conventionally to control application and release of the brakes on the forward portion of the train from the lead locomotive and, in a novel manner, also to effect corresponding control (via radio-transmitted signals initiated by manual operation of the brake valve on the lead locomotive) of the brakes on the remaining portion of the train from the brake valve on a slave locomotive remotely located in the train. Switch devices selectively operated in correspondence to the operation of the brake valve on the lead locomotive establish suitable control circuitry for radio transmission of appropriate brake control signals from the lead to the slave locomotive. One of the switches is controlled through an intermediate valve means so as to cause reduction of equalizing reservoir pressure on the slave locomotive in correspondence with that on the lead locomotive thereby initiating a service application of the brake on the train as the slave locomotive concurrently with that initiated at the lead locomotive.

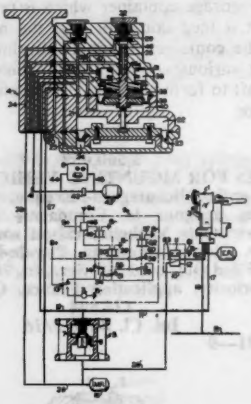
3,560,056
SKID CONTROL SYSTEM
William Stelzer, Milford, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich., a corporation of Delaware
Filed Dec. 16, 1968, Ser. No. 783,794
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 **23 Claims**

A skid control system adapted for operative association with the fluid actuated braking system of an automotive or similar type vehicle; the system including a modulating valve assembly for selectively controlling the flow or supply of hydraulic brake actuating fluid between the master brake cylinder of the vehicle and one or more of



the wheel cylinders thereof; the modulating valve including a pressurized cylinder and being operable in response to and actuatable by an increase in fluid pressure from a source thereof ancillary to the hydraulic brake system.

3,560,057
FLUID PRESSURE BRAKE APPARATUS FOR REMOTE MULTIPLE UNIT LOCOMOTIVE TRAINS
Robert J. Worbois, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa., a corporation of Pennsylvania
Filed May 28, 1969, Ser. No. 828,670
Int. Cl. B60t *15/18*
U.S. Cl. 303—67 **4 Claims**



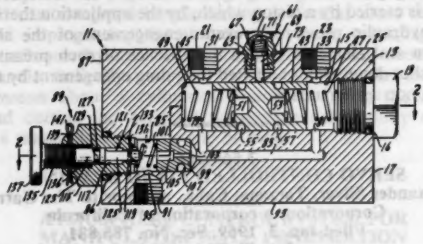
An apparatus utilized in multiple unit train brake controls whereby electrical circuitry, including a brake pipe flow indicator in cooperation with a control signal communication continuity sensing relay, is employed for preventing an undesired recharging of the brake pipe at a location remote from the lead locomotive by operation of a brake valve on a remote locomotive in the train, which recharging would otherwise result when a brake pipe reduction calling for a brake application on the train is effected by the operaton of the brake valve on the lead locomotive at a time when normal control signal communication between the lead locomotive and said remote locomotive is interrupted, thereby preventing initiation of such brake application at said remote locomotive in normal manner.

3,560,058

DISTRIBUTION VALVE

Charles Gale Middleton, Addison, Ill., assignor to Stromberg Hydraulic Brake and Coupling Company, Chicago, Ill., a corporation of Illinois

Filed Apr. 25, 1969, Ser. No. 819,246
Int. Cl. B60t *17/22, 15/00*
U.S. Cl. 303—84 7 Claims



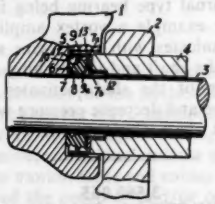
A distribution valve for supplying at least two outlet conduits from one or more inlet or supply conduits and arranged to shut off any one of the outlet conduits upon a pressure drop therein without adversely affecting the supply to the other outlet conduits. The valve is arranged to lock in its shut off positions. A bypass conduit which is normally supplied by all of the supply conduits is provided with its own presslure drop shut off valve and this valve has a manually controlled bleeder.

3,560,059

SEALING DEVICE FOR A HINGE JOINT OF ENDLESS TRACK LINKS

Hideo Miyake, Osaka-fu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho (Komatsu Mfg. Ltd.), Tokyo, Japan

Filed Mar. 13, 1969, Ser. No. 806,797
Claims priority, application Japan, Mar. 21, 1968, 43/21,569; Feb. 4, 1969, 44/9,123; Feb. 8, 1969, 44/10,667
Int. Cl. B62d *55/20*
U.S. Cl. 305—11 8 Claims



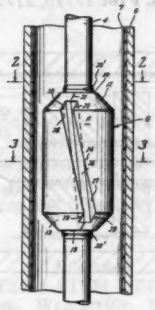
A sealing device for use with a hinge connection structure comprising a pin fixed on a track link of the endless track mechanism and a bushing fixed on an adjacent track link. The pin is received in and surrounded by the bushing with a small clearance therebetween so that an annular space may be formed between the track link on which the pin is fixed and the bushing fixed on the adjacent track link. The sealing device comprises in combination a retainer Z-shaped in cross-section and made of metal or like hard material which has an outer diameter slightly smaller than the inner diameter of said annular recess, and a seal ring made of rubber or like resilient material and formed with at least one lip on its outer circumferential surface so as to form at least one sealed chamber between the lip and the retainer. The retainer is firmly attached to an end face of the bushing so that the retainer may be mounted in the annular recess. The seal ring is mounted in said annular recess such that opposite ends thereof are maintained in contact with the track link and the retainer, whereby the seal ring can be held in place by the retainer and provide a seal to the clearance between the pin and the bushing. The surface of the seal ring maintained in contact with the retainer may have attached thereto a sliding member, which may extend throughout the width of the seal ring, if desired. A lubricant may be contained in the at least one sealed chamber so as to permit the seal ring and the retainer to smoothly move in rotational and sliding motions relative to each other.

3,560,060

ROD GUIDE AND CENTRALIZER

Nate Morris, 10234 Metronome, Houston, Tex. 77042

Filed Dec. 18, 1968, Ser. No. 784,667
Int. Cl. E21b *17/10;* F16c *1/26*
U.S. Cl. 308—4 1 Claim



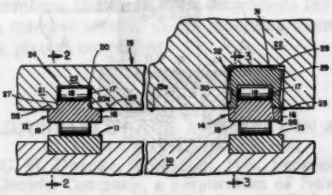
A polyurethane rod guide and centralizer for use on sucker rods extending longitudinally through production tubing such as is used in pumping fluids to the surface in oil wells wherein the rod guide and centralizer surround the rod to position it generally axially of the tubing to prevent engagement of the rods with the tubing when such rods are reciprocated therein for actuating as well pump connected to the sucker rods.

3,560,061

MEANS FOR MOUNTING TRANSLATING MACHINE MEMBER

Howard C. Shaw, Jr., 1955 Quarton Road, Bloomfield Hills, Mich. 48013

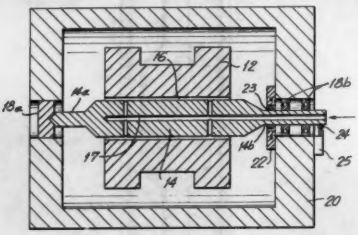
Continuation-in-part of application Ser. No. 694,751, Dec. 29, 1967, which is a continuation of application Ser. No. 494,821, Oct. 11, 1965. This application July 11, 1968, Ser. No. 744,025
The portion of the term of the patent subsequent to Apr. 12, 1985, has been disclaimed and dedicated to the Public
Int. Cl. F16c *19/08*
U.S. Cl. 308—6 1 Claim



The use of specially designed mounting configurations for way bearings of the roller-raceway variety in order to minimize the space required by the bearings and the

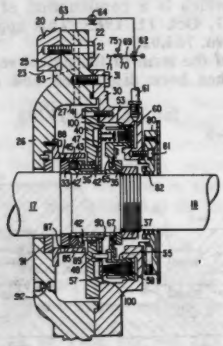
amount of machining ordinarily required on the mounting face of the machine member. In one aspect, the bearing provides a mounting surface between the upper and lower runs to mate with confronting surfaces on the mounting face of the machine member, thereby allowing maximum section strength and minimum machine assembly profile. Where section strength and machine profile are of secondary importance, the bearing mounting utilizes two arcuately contoured surfaces, perpendicularly related between the bearing and the machine member to compensate for manufacturing imperfections.

3,560,062
GAS BEARING ASSEMBLY WITH AUXILIARY BEARING
Leslie C. Kun, Williamsville, and Hans H. Ammann, Hamburg, N.Y., assignors to Union Carbide Corporation, a corporation of New York
Filed Aug. 16, 1968, Ser. No. 753,157
Int. Cl. F16c *17/16, 21/100*
U.S. Cl. 308—9 **9 Claims**



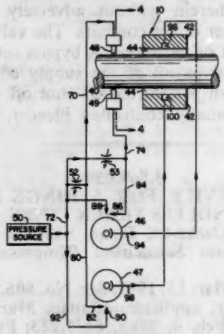
Gas bearing damage may be minimized by attaching auxiliary bearings and restraining means to the normally stationary gas bearing member which restraining means permits auxiliary bearing rotation should the gas bearing fail. Rotor driving force termination may commence when auxiliary bearing rotation begins.

3,560,063
SHAFT SEAL MECHANISM FOR OPEN TYPE FLUID COMPRESSORS
Martin M. McClusky and James W. Endress, Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y., a corporation of Delaware
Filed June 23, 1969, Ser. No. 835,636
Int. Cl. F16c *1/24;* **F16k** *41/00;* **F16j** *15/16*
U.S. Cl. 308—36.2 **5 Claims**



A shaft sealing mechanism for open type fluid compressors, such as refrigeration compressors, in which the operating shaft extends outwardly through the end wall of the compressor bearing housing. The sealing mechanism consists of an assembly of components mounted in the end wall of the bearing housing, the mechanism including running and shut down seals. A common spring means is interposed between the movable elements of the seals and serves to continuously maintain the running seal in sealing engagement and to urge the shut down seal in sealing engagement. The movable element of the shut down seal is carried by a piston which, by the application thereto of hydraulic pressure, prevents engagement of the shut down seal elements but, in the absence of such pressure, the shut down seal is actuated to sealing engagement by the common spring means.

3,560,064
SERVO CONTROLLED FLUID BEARING
Alexander Silver, Tarzana, Calif., assignor to The Garrett Corporation, a corporation of California
Filed Jan. 3, 1969, Ser. No. 788,881
Int. Cl. F16c *1/24*
U.S. Cl. 308—122 **13 Claims**



A servo controlled fluid bearing arrangement is disclosed with a journal type bearing being illustrated. The servo device, for example a vortex amplifier or a fluid amplifier, communicates with a pressure source and the spacing between the shaft and the bushing of the bearing. Eccentric rotation of the shaft activates the device to selectively increase and decrease pressure within the spacing to counteract shaft displacement.

3,560,065
REINFORCED PLASTIC BEARING
Samuel M. Shobert, Mishawaka, and Joseph K. Tunis III, South Bend, Ind., assignors to Plas-Steel Products, Incorporated, Walkerton, Ind., a corporation of Indiana
Filed Feb. 5, 1968, Ser. No. 703,067
Int. Cl. F16c *27/00;* **F02f** *5/10*
U.S. Cl. 308—238 **4 Claims**

A reinforced plastic bearing comprising a generally toric core of glass strands disposed in a resin material, and a tubular layer of tetrafluoroethylene-cotton threads embedded in a resin material and enrobing the core to

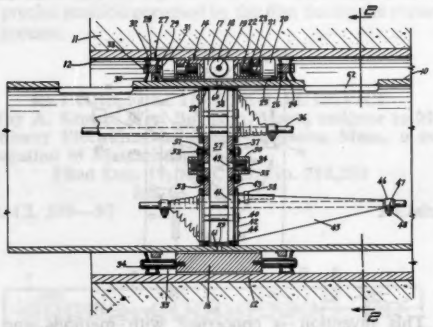
provide an exterior surface including the tetrafluoroethylene fibers of the embedded threads. Preferably, the resin material embedding the tetrafluoroethylene-cotton threads is loaded with finely divided particles of tetrafluoroethylene impregnating the cotton fibers of the embedded threads.

The preferred method for fabricating such a bearing comprises the steps of arranging the glass strands to provide an elongated bundle having a circular cross section and impregnating the strands with resin, arranging the tetrafluoroethylene-cotton threads peripherally about the bundle, helically wrapping the bundle with the threads thereon about a cylindrical mandrel, curing the resin, and cutting the helically wrapped bundle axially along the mandrel to separate the bearings.

3,560,066
ATMOSPHERE CONTROL SYSTEM FOR MANIPULATOR WALL PENETRATION

Demetrius G. Jelatis and Lester W. Haaker, Red Wing, Minn., assignors to Central Research Laboratories, Inc., Red Wing, Minn., a corporation of Minnesota

Filed July 3, 1969, Ser. No. 838,786
Int. Cl. A41g *11/00*
U.S. Cl. 312—1 **10 Claims**



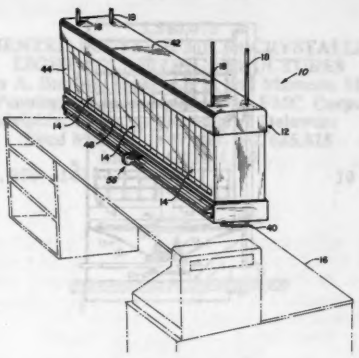
An atmosphere control system against passage of gases or gas-borne substances for the horizontal through tube of a remote control master-slave manipulator. The system includes a pair of spaced apart sealing assemblies with gas chamber between. The manipulator tie rods are sealed by booting. The motion tapes and cables pass between felt wipers. Safety of the operator and/or control of the cell atmosphere is insured by maintaining gas under slight pressure in the gas chamber so as to cause controlled leakage outwardly from that chamber in both directions. Spaced apart rotary lip seals with gas chamber between are also provided in the annular space between the through tube and wall opening to permit free rotation of the through tube while maintaining an effective seal.

3,560,067
MERCHANDISE STORING AND DISPENSING UNIT

Harold J. Stieg, Pittsburgh, Pa., assignor of fifteen percent to Lawrence Skendrovic, West Mifflin, Pa.; twenty percent to Stone & Raynovich, Pittsburgh, Pa., a partnership; and five percent to Walter Saymansky, Washington County, Pa.

Filed Apr. 28, 1969, Ser. No. 819,761
Int. Cl. A47f *1/00, 3/02*
U.S. Cl. 312—42 **10 Claims**

A merchandise storing and dispensing unit is provided which is suspended from overhead at the checkout counter or cash register of a store. The unit contains a plurality of vertically reciprocal merchandise containers that are positionable so that they may be pulled down out of the unit to remove merchandise or positioned up into the unit for storage. The containers are balanced to remain

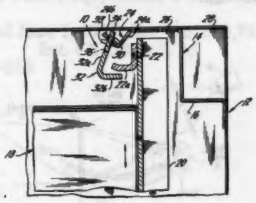


in whatever position they are placed. A lock is provided so that the unit may not have merchandise withdrawn therefrom except in the presence of store personnel. The unit utilizes overhead space for storage and is particularly adaptable for storing and dispensing cartons of cigarettes.

3,560,068
DRAWER LATCH MECHANISM

Walter H. Ostrom, Wescosville, Pa., assignor to The Stanley Works, New Britain, Conn., a corporation of Connecticut

Filed July 15, 1969, Ser. No. 842,442
Int. Cl. E05b *65/46;* **E05c** *15/04*
U.S. Cl. 312—217 **8 Claims**



A latch mechanism for drawer-type cabinets comprises a vertical latch-mounting member secured to the cabinet enclosure and a latch member mounted on the latch-mounting member for pivotal movement into and out of engagement with projecting latch pieces on the drawers. The latch member is mounted on the mounting member by means of a series of spaced-apart lugs on one of the members receivable in corresponding slots in the other of the members, the lugs having formations for retaining the latch member secured to the mounting member while affording pivotal movement.

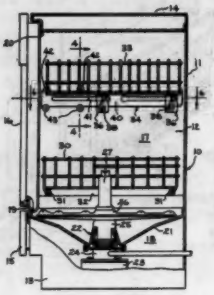
3,560,069
ADJUSTABLE RACK ASSEMBLY IN AN AUTOMATIC DISHWASHER

Donald G. H. Doepke, Greenfield, Wis., assignor to General Electric Company, a corporation of New York

Filed July 1, 1969, Ser. No. 838,201
Int. Cl. A47b *88/00, 95/00*
U.S. Cl. 312—351 **9 Claims**

A dish-supporting rack in a dishwasher cabinet is provided with an improved rack assembly including improved

means for facilitating manual vertical adjustment of the rack. The invention is specifically applicable to a front opening dishwasher having spaced apart upper and lower dish racks that are slidably mounted to be manually moved



to an outward extended position in the access opening to facilitate loading and unloading tableware therein. The vertical adjustment means is provided in combination with the slidable support means of the upper rack.

3,560,070

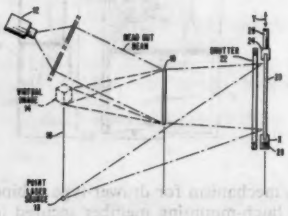
METHOD FOR MAKING SECONDARY HOLOGRAMS FROM MULTIPLEXED HOLOGRAMS OR INTEGRAL PHOTOGRAPHS WHEREIN THE SCREEN EFFECT IS ELIMINATED

Keith S. Pennington, Putnam Valley, and Robert V. Pole, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed Mar. 13, 1968, Ser. No. 712,671

Int. Cl. G02b 27/00

U.S. Cl. 350—3.5 **6 Claims**



A method is described for forming secondary holograms from either a multiplexed (i.e. sampled) hologram or from an integral photograph wherein the screen effect normally produced by either the multiplexed hologram or the integral photograph is eliminated. An integral photograph is a photographic recording of an object through a plane array of fly's eye lenses from which three-dimensional real and virtual images can be later observed. A multiplexed or sampled hologram is a hologram which is formed by interlacing a plurality of holograms on a single emulsion using a mask placed in the reference and/or the integral photograph is eliminated. An integral photograph or hologram of an integral photograph, a screen or grid effect is produced due to the fact that the fly's eye lens array is discontinuous and the areas between the lenses in the array do not record any information. In observing the image from a multiplexed hologram, a similar screen or grid effect appears due to the fact that a mask was employed in producing the multiplexed hologram.

In the method of the present invention, a secondary hologram is recorded in the Fourier transform plane of the image and the secondary hologram plate is translated in the Fourier plane a number of times and a separate recording of the image is superimposed for each translation. Since the secondary hologram plate is in the Fourier plane of the image, the image does not shift due to the translation of the plate. However, since the secondary hologram plate is not in the Fourier plane of the integral photograph or the multiplexed hologram as the case may be, the grid will be recorded at different locations on the secondary hologram for each translation, that is, the grid will shift due to the translation of the hologram. The shifting of the grid for the successive recordings will cause it to smear out and will not be viewable in the resultant secondary hologram.

3,560,071

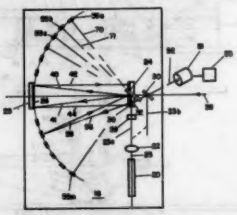
HOLOGRAPHIC RECORDING AND VISUAL DISPLAY SYSTEMS

Daniel Silverman, 5969 S. Birmingham St., Tulsa, Okla. 74105, and Everett A. Johnson, 15 S. Prospect Ave., Park Ridge, Ill. 60068

Filed Apr. 17, 1968, Ser. No. 721,989

Int. Cl. G02b 27/22

U.S. Cl. 350—3.5 **18 Claims**



This invention is concerned with methods and apparatus for recording multiple exposure holograms on a film record and displaying reconstructed images of the separately recorded subjects. Means are provided, by the use of simultaneous application of multiple different reference beams, to reconstruct a plurality of images, each of which can be separately controlled in intensity. Also, the recording of the separate subjects can be controlled in a predetermined timed sequence, and the corresponding reconstruction of the plurality of images can be controlled in the same or different timing sequence. Means are provided for recording the separate subjects by keeping the subject and reference beam in fixed directions and rotating the plane of the recording film.

3,560,072

SYSTEM FOR THE STORAGE, RETRIEVAL AND DISPLAY OF INFORMATION

Daniel Silverman, 5969 S. Birmingham St., Tulsa, Okla. 74105

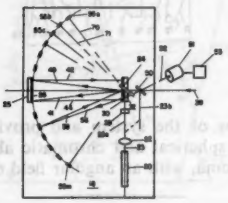
Continuation-in-part of application Ser. No. 612,698, Jan. 30, 1967. This application Apr. 17, 1968, Ser. No. 721,998

Int. Cl. G02b 27/22

U.S. Cl. 350—3.5 **19 Claims**

This invention is concerned with an information storage and retrieval system capable of storing information in the form of microreproductions of pictorial or alphanumeric information or information in digital form. Information in the form of patterns of areas of different color, grayness, or degrees of transparency are recorded on a

photographic medium as multiple holographic, exposures. Each exposure is made with a reference beam of coherent light of different intensity patterns, or of uniform intensity, but different direction with respect to the recording film. The same reference beams are used to reconstruct the recorded images as were used to record them. The reconstructed images can be utilized by direct viewing, by photographic copying or by photoelectric scanning. Means are provided, including patterns or guide indicia, on the subject record and the means to vary the intensity of the reference beams, so that, with the help of servo means responsive to these sets of guide indicia, the subject records and the patterns of the reference beam can be precisely positioned with respect to the holographic film. In preparing the hologram, a pattern of guide indicia is recorded on the film to facilitate the replacement of the developed film to the precise position occupied by the film during the recording process.

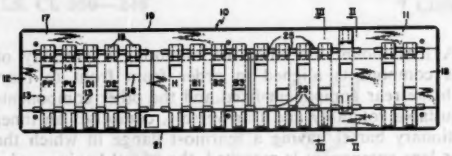


3,560,073

RETROREFLECTIVE SIGNAL DEVICE

LeRoy A. Knapp, West Boylston, Mass., assignor to Machinery Electrification, Inc., Northboro, Mass., a corporation of Massachusetts

Filed Dec. 19, 1968, Ser. No. 785,283
Int. Cl. G02b *5/12*
U.S. Cl. 350—97 **2 Claims**



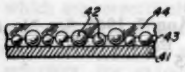
This invention relates to a signal device and, more particularly, to apparatus for use in supplying a pattern of retroreflective spots in an automatic warehousing arrangement or the like.

3,560,074

95% TITANIUM DIOXIDE GLASS SPHEROIDS

Charles E. Searight, Ezra M. Alexander, John R. Ryan, and Steven H. Brasfield, Jackson, Miss., assignors to Cataphote Corporation, Jackson, Miss., a corporation of Ohio

Continuation of application Ser. No. 405,925, Oct. 23, 1964. This application Oct. 21, 1968, Ser. No. 769,433
Int. Cl. G02b *5/12*
U.S. Cl. 350—105 **5 Claims**



Disclosed is the production of glass having at least a 75% by weight equivalent content of titanium dioxide. The glass as small spheres is useful as retroreflective lens for traffic marking surfaces and other uses, wherein the glass spherical elements or beads contain greater than 75% by weight of titanium dioxide and are suitable as retroreflective lens elements.

3,560,075

ORIENTED POLYMER MICROCRYSTALLINE LIGHT POLARIZING STRUCTURES

Orlando A. Battista, Yardley, Pa., and Mamerto M. Cruz, Jr., Pennington, N.J., assignors to FMC Corporation, Philadelphia, Pa., a corporation of Delaware

Filed Mar. 24, 1967, Ser. No. 625,815
Int. Cl. G02b *5/30*
U.S. Cl. 350—147 **10 Claims**

Light polarizing refracting structures are formed from dispersions of anisotropic organic and inorganic polymer microcrystals, the polymers having a crystalline-amorphous morphological structure. The microcrystals are dispersed in a non-solvent liquid medium which may include a dissolved polymer and the dispersion spread or cast into sheet form. The microcrystals are oriented and the liquid is then volatilized to form a film of the microcrystals or to form a polymer sheet containing the dispersed, oriented microcrystals.

3,560,076

CURVED LAMINATED LIGHT POLARIZING DEVICE

Francis G. Ceppi, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass., a corporation of Delaware

Filed June 1, 1967, Ser. No. 642,792
Int. Cl. G02b *5/30*
U.S. Cl. 350—155 **8 Claims**

A strongly curved laminated polarizing lens substantially free of haze and cosmetic defects due to the curve forming operation is disclosed. Laminae on the convex side of the polarizing layer are substantially thicker than on the concave side, thereby reducing the stress on the polarizing layer. The curved shape is imparted after lamination.

3,560,077

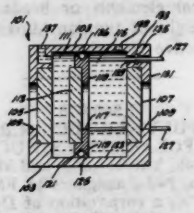
VARIABLE TRANSMISSION PASSIVE Q-SWITCH

Walter R. Sooy, Manhattan Beach, Calif., David P. Bortfeld, Spreitenbach, Switzerland, and Richard E. Bradbury, Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif., a corporation of Delaware

Filed Feb. 19, 1968, Ser. No. 706,385
Int. Cl. G01n *1/10;* **G02f** *1/36*
U.S. Cl. 350—160 **2 Claims**

This is a passive Q-switch that may be adjusted to provide variable transmission characteristics. In its most basic form, it may consist of a cell with spaced and parallel optically flat windows that contains a solution of a passive

Q-switch material such as cryptocyanine dissolved in isopropyl alcohol. The transmission or absorption of the



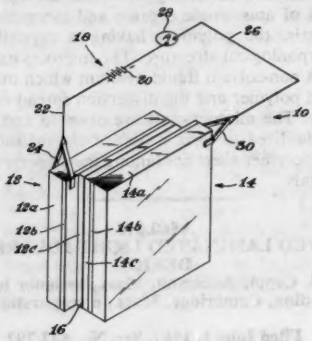
switch is varied by changing the thickness of the absorbing liquid layer between the windows.

3,560,078

COLOR REVERSIBLE LIGHT FILTER UTILIZING SOLID STATE ELECTROCHROMIC SUBSTANCES

James A. McIntyre and Robert D. Hansen, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

Filed July 1, 1968, Ser. No. 741,637
Int. Cl. G02f *1/28*
U.S. Cl. 350—160 **4 Claims**



The invention provides a color reversible light filter system utilizing solid state films of inorganic compounds having electrochromic properties in a multi-layer glass panel. The glass panel consists of two panes of substantially transparent glass, with one pane being coated with a layer of tin oxide, and a film of silver chloride containing free silver, to provide a colorless electrode; the opposite pane being coated with a layer of tin oxide and a film of tungstic acid, or preferably a mixture of tungstic and molybdic acid, to provide a color-reversible electrode. A stable color is developed in the glass panel by applying a DC electrical potential across the electrodes for only a few minutes and, when desired, the panel can be rendered colorless in about the same length of time by reversing the polarity of the electrodes.

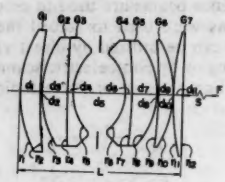
3,560,079

PHOTOGRAPHIC LENS OF LARGE APERTURE RATIO HAVING LONG BACK FOCUS

Zenji Wakimoto and Yoshiyuki Simizu, Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan, a corporation of Japan

Continuation-in-part of application Ser. No. 460,634, June 2, 1965. This application Dec. 13, 1968, Ser. No. 795,382
Claims priority, application Japan, Nov. 12, 1964, 39/87,702
Int. Cl. G02b *9/60*
U.S. Cl. 350—217 **2 Claims**

Lens system of a modified Gauss type in which the thickness of the second lens group is reduced and the thickness of the third group is increased, and in which the last group is separated into two lens elements to lengthen



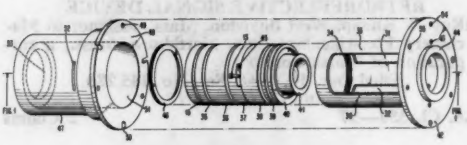
the back focus of the system and provide a F:1.4 lens corrected for spherical and chromatic aberrations, astigmatism and coma, with an angular field of ±23°.

3,560,080

APPARATUS AND METHOD FOR ADJUSTABLY MOUNTING LENSES

Janusz S. Wilczynski, Ossining, N.Y., and William G. Santy, New Canaan, Conn., assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed Jan. 9, 1967, Ser. No. 608,046
Int. Cl. G02b *7/02*
U.S. Cl. 350—252 **2 Claims**



A lens mount assembly for mounting a plurality of lens components aligned in order from front to rear, with the rear component fixed and the other components adjustable rotatably and transversely, comprises an inner stationary barrel having a rearmost flange in which the rear lens component is mounted, the barrel having a plurality of axially extending access slots evenly spaced around the barrel. The barrel contains a diaphragm between lens components which has adjustament means projecting through one of the slots. A plurality of mounting spacer rings formed with ridges is located between and has loosely mounted thereon the lens components. A clamping ring is threaded into the front end of the inner barrel to clamp the lens components into adjusted positions. An outer barrel fits over the inner barrel and is fastened thereto.

3,560,081

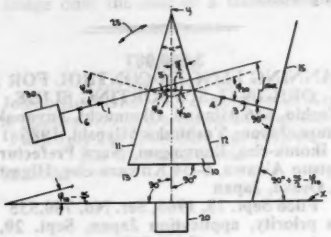
METHOD FOR GENERATING ULTRA-PRECISE ANGLES

Robert L. Appler, Ellicott City, Md., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Aug. 7, 1967, Ser. No. 658,964
Int. Cl. G01b *11/27*
U.S. Cl. 350—285 **6 Claims**

A method for generating ultra-precise angles employing a rotatably supported triangular prism and a fixed position light reflecting mirror adapted, when the prism is in a reference position, to reflect as a parallel return

ray a given ray of monochromatic light incident upon the prism. Upon rotation of the prism through a monitored angular displacement about an axis parallel to the prism refracting surfaces, there is generated an angle defined by the resultant angular displacement of the reflected return ray with respect to the incident ray; the angle thus generated being substantially smaller than the



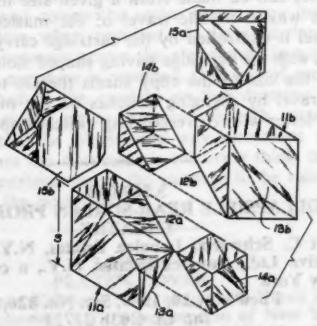
monitored angular displacement of the prism, whereby significantly reducing any error introduced in determining the value of the generated angle due to error encountered in monitoring prism rotation. Angles thus generated have particular utility in testing and calibrating of body rotation monitoring devices, such as autocollimators.

3,560,082

OPTICAL INVERTING SYSTEMS

James Morriss Burch and John William Charles Gates, Teddington, England, assignors to National Research Development Corporation, London, England

Continuation of application Ser. No. 622,755, Mar. 13, 1967. This application Nov. 5, 1969, Ser. No. 874,372
Claims priority, application Great Britain, Mar. 16, 1966, 11,615/66
Int. Cl. G02b *5/04*
U.S. Cl. 350—286 **7 Claims**



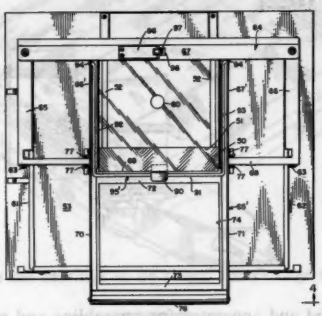
A device for producing from an entering light beam two emerging beams which are mutually inverted with respect to a straight line defined by the device. The entering beam is split at a first semi-reflecting film into two component beams, which are respectively redirected onto opposite faces of a second semi-reflecting film separate from the first by means of two similar and similarly orientated reversing reflectors, for example roof prisms, which are set optically orthogonal to each other and disposed to give equal path lengths for the two component beams between the two films.

3,560,083

MICROIMAGE READER

Philip J. Brownscombe, Millington, N.J., assignor to Eugene Dietzgen Co., Chicago, Ill., a corporation of Delaware

Filed Jan. 24, 1968, Ser. No. 700,125
Int. Cl. G03b *21/14*
U.S. Cl. 353—22 **7 Claims**



Reader for selective projection of microimage on multiimage sheet with roller-guided sheet translating carriage, indexing means, constant focus construction, and adjustable mounting for focus lens.

ERRATUM

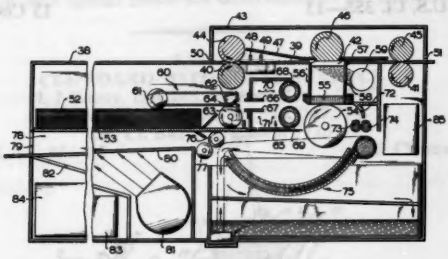
For Class 353—78 see:
Patent No. 3,560,088

3,560,084

EXPOSURE DEVICE FOR COPYING APPARATUS

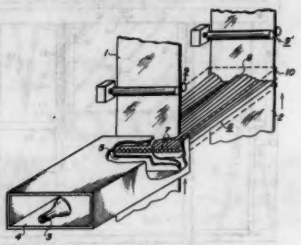
Walter Limberger, Hamburg-Poppenbuttel, Germany, assignor to Lumoprint Zindler KG, Hamburg, Germany, a corporation of Germany

Filed Apr. 25, 1968, Ser. No. 724,193
Claims priority, application Germany, Apr. 28, 1967, L 56,380
Int. Cl. G03b *27/00*
U.S. Cl. 355—1 **8 Claims**



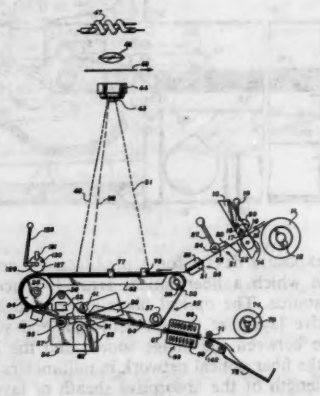
An exposure device for a photographic copying apparatus in which a fiber-optical array is spaced from the image source. The optical fibers are provided with light-absorptive layers at the incident-light end such that the distance between the image source and the image plane across the fiber optical network in millimeters corresponds to the length of the absorptive sheath or layer along the optical fiber, multiplied by the maximum tolerable lack of definition in microns and divided by the cross-section of the fiber parallel to the measurement of the lack of definition in microns.

3,560,085
APPARATUS FOR GRAPHIC DISTORTION
Morton Silverberg, Pittsford, N.Y., assignor to Xerox Corporation, Rochester, N.Y., a corporation of New York
Continuation of applications Ser. No. 506,635 and Ser. No. 506,794, both filed Nov. 8, 1965. This application Aug. 9, 1968, Ser. No. 751,451
Int. Cl. G03b *27/00*
U.S. Cl. 355—1 **4 Claims**



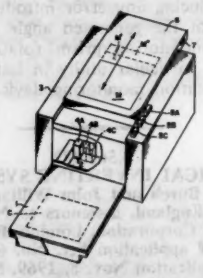
Method and apparatus for scrambling and reconstructing a document pattern so that the resulting scrambled version is unintelligible to the observer and wherein precise registration of the scrambled version with an unscrambling unit is unnecessary. In the first embodiment, a bundle of fiber optics have the ends thereof placed in contact with a document and a recording surface. The document end of the fiber optics is formed into an orderly array of rows and columns, while the recording end of the bundle has the individual fibers formed into a series of corresponding mathematically continuous curves. In the second embodiment, a fiber optic bundle has one end formed as a single straight line and the other end as a mathematically continuous curve, wherein the straight line end of the fiber optic bundle is used to scan an original while the curved end simultaneously composes the distorted image on a copy surface.

3,560,086
ELECTROSTATIC PROCESSOR
Bevan H. Johnston, La Mesa, Calif., assignor, by mesne assignments, to Stromberg Datagraphix, Inc., Rochester, N.Y., a corporation of Delaware
Filed Nov. 6, 1967, Ser. No. 680,691
Int. Cl. G03g *15/00*
U.S. Cl. 355—13 **13 Claims**



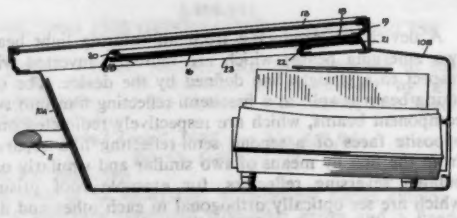
A processor is described for reproducing images from microfilm and the like in which flexible sheet material, such as paper, is fed through a cutter to a conveyor. The sheet material position is sensed to activate cutting, exposing and developing operations. The conveyor allows sheet material slippage during cutting. Different sheet sizes may be obtained by utilizing a plurality of sensors which are positioned at predetermined locations and which may be individually selected for control, either manually or automatically. The cutter may be deactivated to permit exposing and developing on a continuous strip, in which case exposure may be synchronized with sheet movement by a timing wheel.

3,560,087
SCANNING LENGTH CONTROL FOR AN ORIGINAL SUPPORTING SLIDE
Takaji Washio, 616 Minami, Okamachi, Toyonaka, Osaka Prefecture, Japan; Yoshitake Miyoshi, 1985–1 Tawaraguchi, Ikoma-cho, Ikoma-gun, Nara Prefecture, Japan; and Tatsuo Aizawa, 6–34 Kuwazu-cho, Higashisumiyoshi-ku, Osaka, Japan
Filed Sept. 18, 1968, Ser. No. 760,535
Claims priority, application Japan, Sept. 20, 1967, 42/60,319
Int. Cl. G03b *27/32*
U.S. Cl. 355—14 **7 Claims**



Equipment for limiting the travel of a master carrying slide during the exposure of a charged electrophotographic copy sheet so the travel of the master will be limited to the length of the copy and the slide will immediately return to its starting position so that a maximum number of copies can be made from a given size master and no time is wasted in idle travel of the master. The extent of travel is controlled by the cartridge carrying the copy sheets, with the cartridge having shaped slots corresponding to the size of the copy sheets therein to control the slide travel by engaging switches on the machine which are in series with corresponding switches operated by the slide.

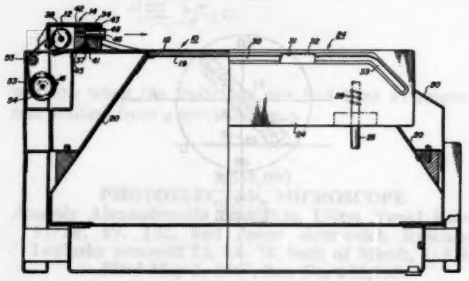
3,560,088
COLLAPSIBLE REAR-SCREEN PROJECTION THEATRE
Robert C. Schwartz, Jamaica Estates, N.Y., assignor to Motiva Ltd., Jamaica Estates, N.Y., a corporation of New York
Filed May 20, 1969, Ser. No. 826,199
Int. Cl. G03b *21/28*
U.S. Cl. 353—78 **5 Claims**



A collapsible rear-screen projection theatre for successively presenting the images of film slides contained

in a standard slide projector. The projector is installed in a box-like carrying case at an optical position to direct a slide image onto a first mirror secured to the inclined front wall of the case. Mounted above an opening in the top of the case is a foldable screen assembly having a second mirror secured to an inclined rear panel thereof, such that when the assembly is in the erect state, the slide image is reflected by the first mirror through the opening onto the second mirror which, in turn, directs the image onto the rear of a translucent screen.

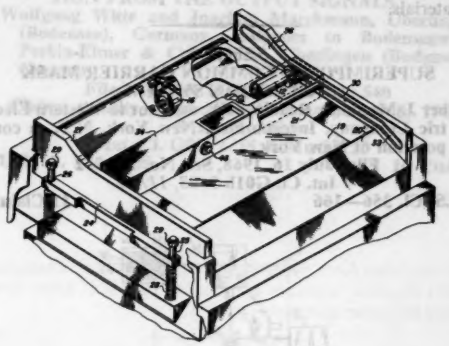
3,560,089
PLATEN COVER
Hugh L. Jones, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y., a corporation of New York
Filed July 26, 1968, Ser. No. 747,906
Int. Cl. G03b *27/62*
U.S. Cl. 355—82 **3 Claims**



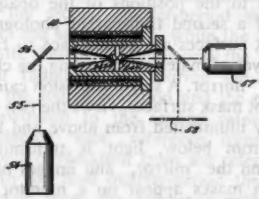
A cover for a platen employing a pair of curtains which are drawn in succession from rolls over the platen. The first or leading curtain is of a size sufficient to at least cover the transparent portion of the platen when unrolled and consists of a material with inherent self-coiling tendencies. The second or trailing curtain is larger than the first curtain and covers the entire platen area including the first curtain when unrolled. A draw carriage supported for movement across the platen area in a pair of liftable track members is provided. One end of each curtain is attached to the carriage so that drawing of the carriage across the platen area unrolls both curtains in succession onto the platen and any document resting thereon. Where the document is relatively thick, the liftable track members enable the carriage to be raised for passage over the document.

3,560,090
PLATEN COVER
Burton L. Jones, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y., a corporation of New York
Filed July 26, 1968, Ser. No. 747,907
Int. Cl. G03b *27/62*
U.S. Cl. 335—82 **10 Claims**

A cover for a platen employing a pair of curtains which are drawn in succession from rolls over the platen. The first or leading curtain is of a size sufficient to at least cover the transparent portion of the platen when unrolled and consists of a material with inherent self-coiling tendencies. The second or trailing curtain is larger than the first curtain and covers the entire platen area including the first curtain when unrolled. A draw carriage supported for movement across the platen area in a pair of liftable track members is provided. One end of each curtain is attached to the carriage so that drawing of the carriage across the platen area unrolls both curtains in succession onto the platen and any document resting thereon. Where the document is relatively thick, the liftable track members enable the carriage to be raised for passage over the document.

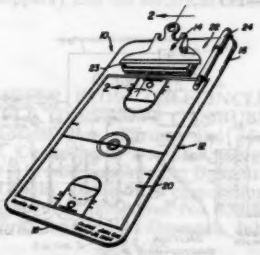


3,560,091
HIGH PRESSURE OPTICAL CELL
Alvin Van Valkenburg, McLean, and Ellis R. Lippincott, Vienna, Va., and Charles E. Weir, Washington, D.C., assignors to High Pressure Diamond Optics, Inc., McLean, Va.
Filed Apr. 12, 1968, Ser. No. 720,866
Int. Cl. G01b *11/16;* **G01n** *1/00, 21/16*
U.S. Cl. 356—32 **2 Claims**



A high pressure optical cell has an insert and temperature varying means for the material tested, which may be a coil within the insert of insulating material or a laser beam with optical means for observation of the material.

3,560,092
CLIPBOARD WITH SLATE SURFACE
L J Coney, Box 265, Roxton, Tex. 75477
Filed July 24, 1968, Ser. No. 747,270
Int. Cl. B42f *1/02;* **B43l** *1/10*
U.S. Cl. 35—62 **3 Claims**



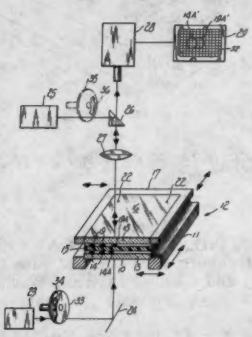
A rectangular shaped board whose surface on both sides thereof is of slate or other material that will accept chalk as the writing medium therefor. Indicia of a basketball

court, football field or other field of athletic contest are aligned in the longitudinal direction of the board with a clip at one end thereof to hold overlying papers or other materials.

3,560,093
SUPERIMPOSED COMMON CARRIER MASK INSPECTION SYSTEM

Liber J. Montone, Reading, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y., a corporation of New York

Filed July 16, 1968, Ser. No. 745,232
Int. Cl. G01b *9/08, 11/24*
U.S. Cl. 356—166 **11 Claims**

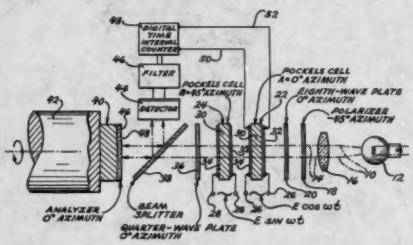


A system in which the positions of the opaque areas on the surface of a first transparent photographic mask are compared to the positions of the opaque areas on the surface of a second transparent photographic mask. The two mask surfaces are placed face to face and separated by a layer of material possessing the characteristics of a "one-way" mirror. A single television camera, focused on the adjacent mask surfaces, views the two masks which are alternately illuminated from above and below. When illuminated from below, light is transmitted through both masks and the "mirror," and images of the opaque areas on both masks appear on a monitor. When illuminated from above, the "mirror" reflects light and only the image of the opaque areas on the upper mask appears on the monitor. A "flicker effect," or other visual differential detection system, indicates the degree of deviation of the positions of the opaque areas on the first mask from the second mask.

3,560,094
SHAFT POSITION ENCODER

Carlo Del Carlo, Utica, Mich., assignor, by mesne assignments, to Teeg Research Inc., Detroit, Mich., a corporation of Delaware

Filed July 13, 1965, Ser. No. 472,402
Int. Cl. G01r *21/40;* **G02f** *1/26*
U.S. Cl. 356—117 **8 Claims**

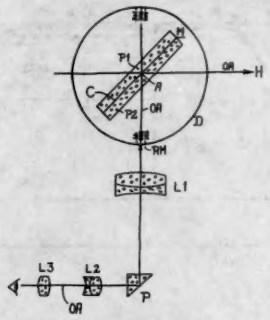


An optical shaft encoder utilizing a beam of polarized light which is modulated according to a predetermined frequency by a modulation signal. The modulated polarized light is passed through an analyzer mounted on the end of a shaft whose angular position is to be measured. The light emerging from the analyzer impinges upon a detector which provides an electrical signal at its output which is compared to the modulation signal. The phase shift between the modulation signal and the detected signal is proportional to the angle of rotation of the shaft.

3,560,095
THEODOLITE

Charles Fredrik Wilhelm Thorlin, Stockholm, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden, a corporation of Sweden

Filed May 26, 1969, Ser. No. 827,500
Claims priority, application Sweden, June 7, 1968, 7,649/68
Int. Cl. G01b *11/26*
U.S. Cl. 356—140 **4 Claims**



In a theodolite, the optical axis is deflected by a mirror attached to a rotatable disk having a circumferential scale graduated in angles. To eliminate errors of centricity of the disk axis relative to the scale, the disk is reversible about the axis of rotation and the mirror is provided with a reflective surface on the rear side, scale markings being provided for reading off a value 180° different from that corresponding to the original position.

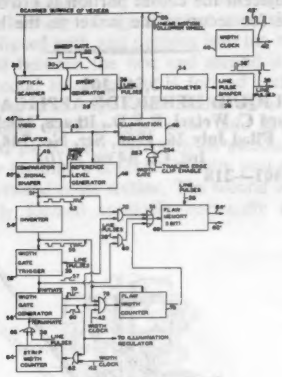
3,560,096
VENEER CLIPPER CONTROL SYSTEM

Gerald L. Watson, Portland, and Lloyd R. Bristol, Beaverton, Oreg., assignors to Morvue, Inc., Tigard, Oreg., a corporation of Oregon

Filed Dec. 7, 1967, Ser. No. 688,954
Int. Cl. G01b *11/00;* **G01n** *21/16*
U.S. Cl. 356—156 **7 Claims**

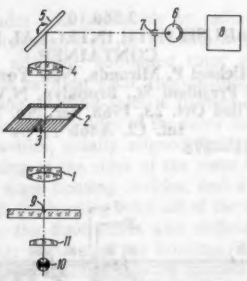
A television camera tube optically scans evenly spaced lines across a longitudinally moving strip of veneer in response to line pulses derived from a tachometer synchronized with the movement of the strip and under automatically controlled strip illumination conditions. Strip width and flaw width counters of clock pulses controlled by the output of the camera tube cause the production of a flaw pulse, if along any line scan the width of good wood is incorrect or at least one flaw of excessive width is present. A flaw length counter of flaw pulses in conjunction with a line pulse counter determine what portions of the strip are unacceptable and in conjunction with delaying counters of line pulses cause actuation of the knife to cut unacceptable portions from the strip and to cut panels from acceptable portions of predetermined minimum width and also standard maximum width. A

knife response compensator compensates for errors due to changes in rate of movement of the strip and for knife



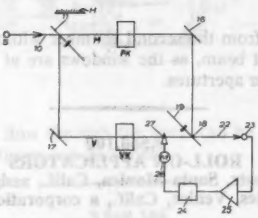
position when the knife has not had time to return to rest position from a previous clip.

3,560,097
PHOTOELECTRIC MICROSCOPE
Anatoly Alexandrovich Gavrilkin, Ulitsa Yanki Kupaly 17/30, kv. 112, and Jakov Aronovich Raikhman, Leninsky prospekt 53, kv. 78, both of Minsk, U.S.S.R.
Filed May 3, 1967, Ser. No. 635,730
Int. Cl. G01b *11/04*
U.S. Cl. 356—170 **3 Claims**



A photoelectric microscope for measuring the position of at least one reference line or dash with respect to its optical axis is characterized in that its optical axis is not the center of oscillations of a scanner but the axis of a constructional base element, i.e. of a slit diaphragm, the position of the reference line or dash being determined relative to the borders of said slit diaphragm by the relation between time intervals in a signal characteristic of the superimposed and time-base scanned image of a mask with the base slit diaphragm and the image of the reference line or dash sighted in the plane of this mask with the diaphragm. The photoelectric microscope determines with high accuracy not only the moment of alignment with the axis of the reference line or dash, but it also measures the position of the reference dash relative to the optical axis of the photoelectric microscope with further presenting of the output information in digital form or in linear units, for which purpose the width of the slit diaphragm is used as a scaling element.

3,560,098
DOUBLE-BEAM PHOTOMETER INCLUDING STRUCTURE TO ELIMINATE RE-RADIATION FROM THE OUTPUT SIGNALS
Wolfgang Witte and Joachim Marckmann, Uberlingen (Bodensee), Germany, assignors to Bodenseewerk Perkin-Elmer & Co. GmbH, Uberlingen (Bodensee), Germany
Filed Apr. 30, 1969, Ser. No. 820,540
Claims priority, application Germany, May 8, 1968, P 17 72 389.6
Int. Cl. G01j *1/36;* **G01n** *21/22*
U.S. Cl. 356—205 **10 Claims**

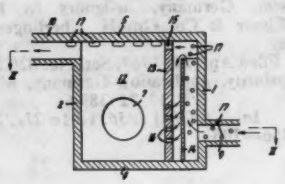


A double-beam photometric system (e.g., a spectrophotometer) causes the radiation from the source to pass through the (first) sample path during a first quarter-period to the detector, so that the detector receives sample-transmitted radiation, P, plus "characteristic" radiation generated by the elements in the sample path, P_0. During the second quarter-period the radiation is blocked from the sample path, while the detector "sees" this same path, thereby obtaining only the "characteristic" sample path radiation, P_0. During the third quarter-period both the source radiation and the path to the detector are switched to the second reference path, so that the detector "sees" reference transmitted source energy, V, plus re-radiation from the reference path elements, V_0. In the final quarter-period the source radiation is blocked from the reference path, so that the detector sees only the reference path re-radiation, V_0. Thus the four quarter-period signals are: $P+P_0$, P_0 $V+V_0$, and V_0. By synchronously demodulating the detector signal so as to invert the second and third quarter-periods together relative to the first and fourth, the four signals become: $+P+P_0$, $-P_0$, $-V-V_0$, and $+V_0$. Thus the D.C. sum of the signals is $P-V$, free of all re-radiation components, which signal may therefore be utilized in a conventional servo-system to drive a reference beam attenuator so as to cause a nulling of the difference between P and the attenuated V signal. This system is relatively insensitive to errors in phase synchronization of the optical switching means (e.g., rotating sector choppers) and the electrical demodulator.

3,560,099
COLORIMETER FLOW CELL INCLUDING A BAFFLE TO REMOVE GAS BUBBLES
Christian Thorkild Boe, Farum, and Mogens Myrup Andreasen, Copenhagen, Denmark, assignors to Instituttet for Produktudvikling, Danmarks Tekniske Hojskole, Lyngby, Denmark, a corporation of Denmark
Filed July 7, 1969, Ser. No. 839,528
Claims priority, application Denmark, July 10, 1968, 3,385/68
Int. Cl. G01n *1/10*
U.S. Cl. 356—246 **6 Claims**

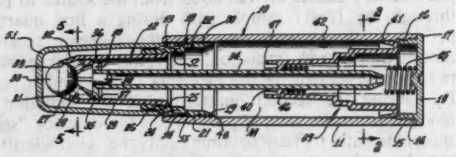
A colorimeter flow call with opposed windows for the passage of a light beam. The cell is divided in two chambers by a wall extending parallel to the light beam. Liquid

enters the first chamber and flows to the second chamber through upper and lower apertures in the wall. Gas is separated from the liquid in the first chamber and passes



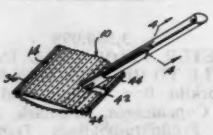
to an outlet from the second chamber without interfering with the light beam, as the windows are at a lower level than the upper apertures.

3,560,100
ROLL-ON APPLICATORS
Walter B. Spatz, Santa Monica, Calif., assignor to Spatz Laboratories, Venice, Calif., a corporation of California
Filed Mar. 10, 1969, Ser. No. 805,743
Int. Cl. B43k *5/06*
U.S. Cl. 401—180 **27 Claims**



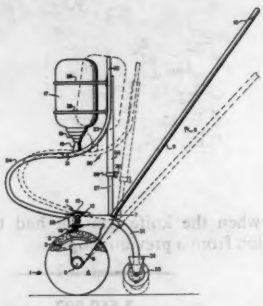
A spring-actuated piston forces a fluent mass in a barrel against a rollable ball in a forward barrel portion, the latter having a left-hand threaded connection with a rearward barrel portion whose inner wall is elliptical and slidably and sealingly engaged by the piston. A cap is releasably coupled to the forward barrel portion. Turning the cap turns the forward barrel portion on the rearward barrel portion, binding the piston against the wall and then threading the forward barrel portion away from the piston to relieve the fluent mass of the spring pressure.

3,560,101
DISPOSABLE SWAB AND HOLDER
Ragnvald G. Leland, 2334 W. 241st St., Lomita, Calif. 90717
Filed Apr. 11, 1969, Ser. No. 815,325
Int. Cl. A47l *17/02*
U.S. Cl. 401—201 **2 Claims**



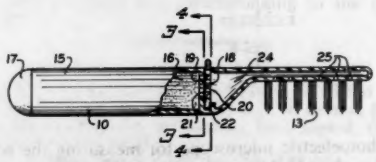
A disposable swab and holder comprising a swab member of flexible material for holding detergent, said flexible material being adapted to be folded upon itself to form a jacket to fit upon a holder. The jacket has open ends and is provided with a cutout portion adjacent one side thereof, and said cutout portion receives a handle of a holder therethrough. The holder is provided with a flat upper surface and a curved lower surface and widening means disposed on the handle to prevent the jacket from coming detached from the holder and one of the flaps formed adjacent the cutout portion is provided with sealing means for securing the jacket to the holder.

3,560,102
LIQUID HERBICIDE APPLICATOR
Clifford C. Wetzel, R.F.D., Ithaca, Mich. 48849
Filed July 26, 1968, Ser. No. 748,051
Int. Cl. B43m *11/02*
U.S. Cl. 401—218 **13 Claims**



A liquid herbicide applicator having a soft, rubber-like roller to which a liquid herbicide is distributed by gravity, the quantity of liquid distributed to the roller being regulated by vertical adjustment of the supply of liquid. The flow of liquid from the source to the roller is self-controlled in accordance with the position of the applicator.

3,560,103
TOOTHBRUSH WITH INTEGRAL DENTIFRICE CONTAINER
Michael P. Miranda, New York, N.Y. (745 President St., Brooklyn, N.Y. 11215)
Filed Oct. 23, 1968, Ser. No. 770,008
Int. Cl. A46b *11/04*
U.S. Cl. 401—278 **5 Claims**

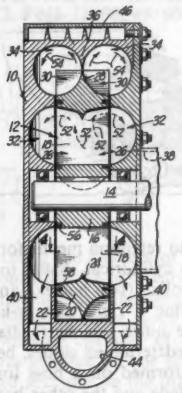


Toothbrushes adapted for carrying in the pocket or purse wherein the dentifrice and brush are both contained within a closable container.

3,560,104
TWO-STAGE, VORTEX-TYPE CENTRIFUGAL COMPRESSOR OR PUMP
Abas Beaucan Neale, 3172 Ellington Drive, Hollywood, Calif. 90028
Filed Feb. 28, 1969, Ser. No. 803,248
Int. Cl. F04d *1/00, 1/08, 17/08*
U.S. Cl. 415—83 **17 Claims**

A rotor is enclosed by a housing rotatable preferably about a horizontally extending central axis, the rotor having a central first stage spindle and an annular second

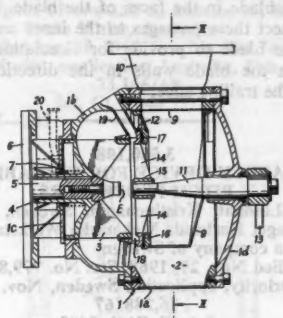
stage spindle spaced outwardly therefrom with first stage blades between the spindles and second stage blades projecting radially outwardly from the second stage spindle. Radially separated annular fluid cavities, preferably substantially totally arcuate in radial cross sections, are formed in the housing axially adjacent each side of the rotor axially aligned with and opening into the rotor fluid cavities formed between the first and second stage rotor blades. The second stage spindle is formed arcuately inwardly along the first stage rotor blades either partially or totally dividing the first stage rotor fluid cavities into axially adjacent parts, each part with its associated housing fluid cavity forming a combined cavity part approaching circular in radial cross section. The second stage spindle is similarly formed arcuately outwardly along the



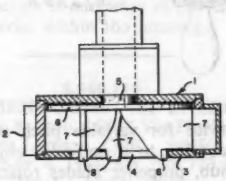
second stage blades and preferably to radially adjacent similar inward projections of the housing to provide two or three axially adjacent, combined rotor and housing second stage fluid cavities, each approaching circular in radial cross section. A fluid inlet is formed through the housing from one or both sides of the rotor into the housing first stage cavities, axially aligned fluid communications in the housing at the sides of the rotor between the first and second stage housing cavities, and a fluid outlet upwardly through the housing from all of the second stage housing cavities, the fluid inlets and outlets preferably being in the lower portion of the housing. Where necessary, a cooling fluid channel may be formed around the housing outwardly of the second stage fluid cavities and radially aligned with all of said cavities.

3,560,105
IMPELLER PUMP
Graham F. Clifford, Stanley, N.C., assignor to Samuel Pegg & Son Limited, Leicester, England, a British company
Filed Jan. 2, 1969, Ser. No. 788,446
Claims priority, application Great Britain, Jan. 2, 1968, 211/68
Int. Cl. F04d *29/40, 31/00;* **FO1d** *25/24*
U.S. Cl. 415—116 **4 Claims**

A reversible impeller pump comprising a casing defining a chamber in which is mounted a rotary impeller and which has two circumferentially spaced ports communicating with liquid flow conduits, and a reversing mechanism comprising a conduit substantially in the form of a pipe elbow which is mounted in the chamber with one limb thereof in communication with the eye of the impeller and which is turnable about the axis of the other limb to bring the latter selectively into register completely or partially with the ports, whereby the direction of liquid flow through the ports can be reversed and the rate of delivery can be varied.

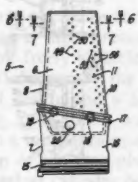


3,560,106
SLURRY HANDLING PUMP
Nils-Johan Sahlstrom, % Sahlstrom Manufacturing Co., N-J Sahlstrom Maskin AB, Suntetorp, Skovde, Sweden
Filed Feb. 13, 1969, Ser. No. 799,017
Int. Cl. F01d *1/02, 25/24;* **F04d** *7/00*
U.S. Cl. 415—204 **6 Claims**



A slurry handling pump including a scrool casing and a centrifugal impeller having angularly spaced blades with their inner edges being radially spaced from the axis of rotation of the impeller. Portions of the free ends of the blades towards the axis of rotation extend outwardly of the pump inlet. The pump inlet includes a pair of slots extending radially from the edge thereof.

3,560,107
COOLED AIRFOIL
Harold E. Helms, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware
Filed Sept. 25, 1968, Ser. No. 762,410
Int. Cl. F01d *5/08*
U.S. Cl. 416—90 **3 Claims**



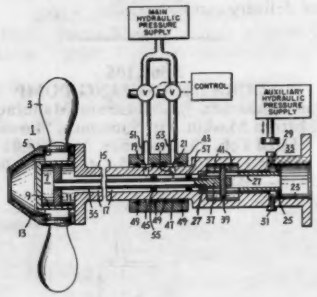
A convection cooled airfoil for high temperature turbomachines is of laminated structure with an outer layer of thoria dispersed nickel chrome alloy and an inner layer

of Hastelloy X. These are bonded together. Grooves in the inner surface of the outer layer and outer surface of the inner layer register to provide passages extending chordwise of the blade in the faces of the blade. Holes in the layers connect these passages to the inner and outer surfaces of the blade to provide for circulation of cooling air through the blade walls in the direction from the leading to the trailing edge.

3,560,108
SAFETY DEVICE FOR VARIABLE PITCH PROPELLERS

Carl-Axel Lindahl, Kristinehamn, Sweden, assignor to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden, a company of Sweden

Filed Nov. 29, 1968, Ser. No. 779,838
Claims priority, application Sweden, Nov. 28, 1967, 16,288/67
Int. Cl. B63h *3/08*
U.S. Cl. 416—157 **5 Claims**

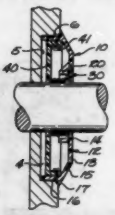


A safety device for variable pitch marine propellers comprises, according to a preferred embodiment of the invention, a hub, propeller blades rotatably mounted in the hub for adjustment of their pitch, and a fluid motor located in the hub to effect such adjustment. A second fluid motor is normally inoperative, but, upon failure of the first motor, operates, independent of the first motor, to change the propeller pitch to one providing forward movement of the ship, regardless of the pitch then established by the main pitch-control system.

3,560,109
ANTIWINDMILLING

John G. Lewis, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo., a corporation of Missouri

Filed June 2, 1969, Ser. No. 829,468
Int. Cl. B64c *11/00*
U.S. Cl. 416—169 **11 Claims**

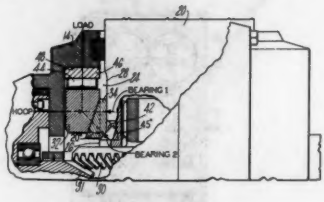


In a unidirectional electric fan a movable brake surface is resiliently biased toward a motor shaft by means anchored to a fixed frame and external to the motor shaft and moved in a direction away from the shaft by the shaft itself when the shaft is driven by the motor. Preferably, a multiturn spring embraces the shaft and has a part anchored to a fixed frame and another part in frictional engagement with a bearing surface on the shaft. The spring is so formed and arranged as to move away from the bearing surface when the motor shaft is rotated in the direction in which it is driven by the motor and to move toward the bearing surface when the shaft is not rotated in that direction.

3,560,110
RETENTION MEANS

Robert W. Cornell, West Hartford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn., a corporation of Delaware

Filed Jan. 3, 1969, Ser. No. 788,857
Int. Cl. B64c *11/06*
U.S. Cl. 416—214 **6 Claims**

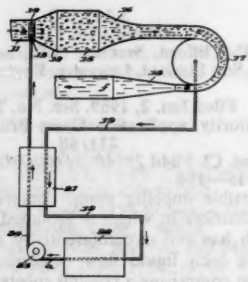


This relates to retention means for securing a propeller blade, having a cylindrical shank, to its hub and consisting of a split collar (two halves) and a ring cooperating therewith forming a rigid unitary-like connection. Cam surfaces on the inner and outer diameter of the collar, each having predetermined slopes, bear against a complementary slope formed on a boss formed on the root of the propeller blade and the other bears against a complementary slope formed on the ring so that the wedging action when assembled, forces the inner diameter of the collar to bear against both the slope on the boss and the cylindrical surface of the blade. The angles of the slopes are so selected as to prevent rocking or fretting action when in the assembled condition and to provide load paths to enhance the structural system.

3,560,111
METHOD OF AND APPARATUS FOR PUMPING LIQUIDS AT HIGH TEMPERATURE BY MAKING A GASEOUS EMULSION

Jacques Sterlini, Paris, France, assignor to Compagnie Electro Mecanique, Paris, France

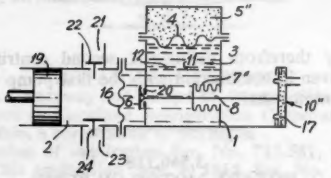
Filed Nov. 22, 1968, Ser. No. 778,121
Claims priority, application France, Dec. 1, 1967, 130,635
Int. Cl. F04b *19/00, 19/24;* **F04f** *1/00*
U.S. Cl. 417—54 **3 Claims**



A method and apparatus for pumping hot liquids by making a gaseous emulsion in which a gas flowing in a

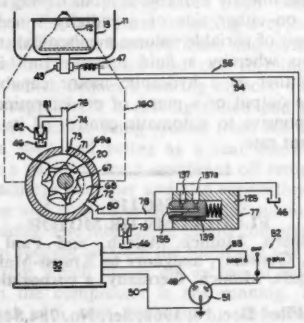
closed cycle is injected in a compressed state in the form of fine bubbles into a hot liquid to be pumped to form an emulsion. The gas in the emulsion is allowed to heat up to the temperature of the liquid, the emulsion is then expanded accompanied by a transfer of heat from the liquid to the gas, the gas is then separated from the liquid and, after cooling, is passed to a low temperature compressor. The gas after being compressed is then reinjected into the liquid following a heat exchange with the hot gas after being separated from the liquid.

3,560,112
DEVICE FOR CONTROLLING THE DELIVERY OF A RECIPROCATING PUMP
Lev Nikolaevich Britvin, Ul. Dybenko 12, kv. 51, Moscow, U.S.S.R.
Filed Sept. 3, 1968, Ser. No. 756,965
Int. Cl. F04b *11/00, 49/00*
U.S. Cl. 417—275 **6 Claims**



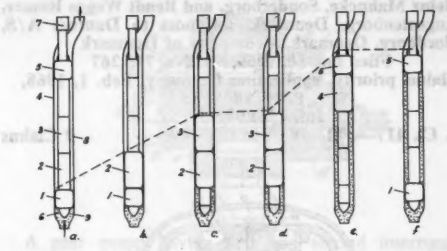
A device for controlling the delivery of a reciprocating pump comprises a controlled by-pass valve connected to an elastic member mounted in a housing of the device, the by-pass valve defining an inner space in the housing separated from the working chamber of the pump. The elastic member receives pressure on one side thereof from a source of power and pressure on the other side thereof from the inner space. The surface of the elastic member, which is opposite the surface facing the inner space, forms, together with the housing, an outer space of a variable volume which is hermetically isolated from the inner space.

3,560,113
CONTROL VALVE
Curtis E. Kurtz, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill., a corporation of Delaware
Filed Aug. 11, 1969, Ser. No. 849,074
Int. Cl. F04b *49/00*
U.S. Cl. 417—294 **9 Claims**



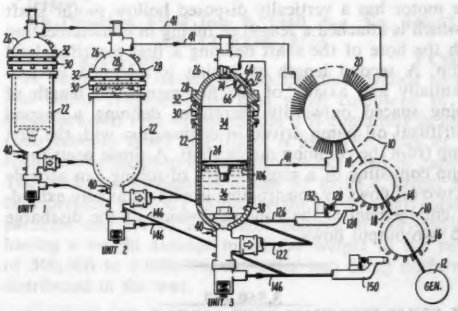
A flow control valve for a fluid power transmission having a valve body receiving a slidable valve spool responsive to centrifugal action to control flow. A dash-pot valve is provided in the spool responsive to fluid pressure to control fluid flow.

3,560,114
PUMP
Bede Alfred Boyle, Newcastle, New South Wales, Australia, assignor of one-half to Laurice W. Boyle, Newcastle, New South Wales, Australia
Filed Jan. 28, 1969, Ser. No. 794,744
Claims priority, application Australia, Feb. 6, 1968, 33,166/68
Int. Cl. F04b *17/00*
U.S. Cl. 417—347 **7 Claims**



A pump for pumping slurries or other high viscosity fluids without the use of valves through which the pump fluid is required to pass. The pump has an elongated housing having a plurality of resilient expandible chambers or sacks axially aligned therein. When a chamber is contracted it leaves an annular gap between itself and the interior walls of the housing and when expanded, seals sufficiently tightly against the smooth interior walls so that no valving action is necessary to prevent backflow of the pumped material within the housing.

3,560,115
THREE ELEMENT COMBINED ENERGY CYCLE
Eric A. Salo, 15898 Via Pinale, San Lorenzo, Calif. 94580
Filed Nov. 4, 1968, Ser. No. 773,000
Int. Cl. F04b *17/00*
U.S. Cl. 417—339 **6 Claims**



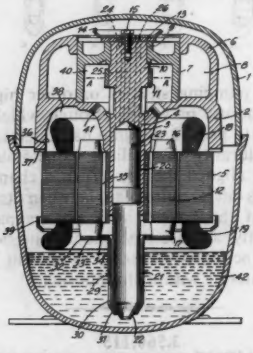
A combustion pump, primarily for powering an electric generator, having: a high pressure cylindrical casing containing a piston freely slidable within the casing; an hydraulic chamber, defined by the bottom of the free piston, the cylindrical casing and a hemispherical lower portion of the casing, into which water is admitted to raise the free piston to a top position; a combustion chamber defined by the top of the free piston, the cylindrical casing and a hemispherical cylinder head wherein a compressed mixture of fuel and air is admitted and ignited, whereby the piston is forced to descend, pumping the water in the hydraulic chamber at high pressure to a first hydraulic impulse turbine, and thereafter, upon reaching, a

lower first terminal pressure, pumping the water to a second hydraulic impulse turbine until a selected second terminal pressure is reached, whereupon the products of combustion are discharged to a gas turbine.

3,560,116
ENCLOSED MOTOR-COMPRESSOR, PARTICULARLY A SMALL REFRIGERATING MACHINE

Knud V. Valbjorn, Nordborg, Hans Ulrik Leffers and Heinz Mahncke, Sonderborg, and Bendt Wegge Romer, Augustenborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark, a company of Denmark

Filed Jan. 30, 1969, Ser. No. 795,267
Claims priority, application Germany, Feb. 1, 1968, P 16 28 157.5
Int. Cl. F04b *39/02*
U.S. Cl. 417—372 **9 Claims**



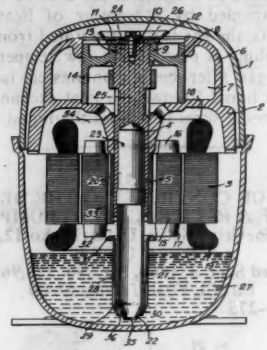
An encapsulated refrigeration motor-compressor hermetically sealed in a capsule and in which the motor is cooled by a separate oil flow than that lubricating the compressor. The two independent oil flows are taken from a common oil sump by a twin centrifugal pump. The motor has a vertically disposed hollow motor shaft to which is attached a length of tubing in communication with the bore of the shaft defining a first centrifugal oil pump. A second length of tubing is mounted circumferentially and axially of the first-mentioned length of tubing spaced outwardly therefrom defining a second centrifugal oil pump driven in conjunction with the first pump from the common motor shaft. A single centrifugal pump consisting of a single length of tubing can provide the two oil flows by constructing it with an axially extending enlargement at the zone of division of the discharge into two output flows.

3,560,117
OIL PUMP FOR ENCLOSED MOTOR-COMPRESSOR, ESPECIALLY FOR SMALL REFRIGERATING MACHINES

Knud V. Valbjorn, Nordborg, and Hans Ulrik Leffers and Heinz Mahncke, Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark, a company of Denmark

Filed Jan. 30, 1969, Ser. No. 795,301
Claims priority, application Germany, Feb. 1, 1968, P 16 28 156.4
Int. Cl. F04b *39/02*
U.S. Cl. 417—372 **8 Claims**

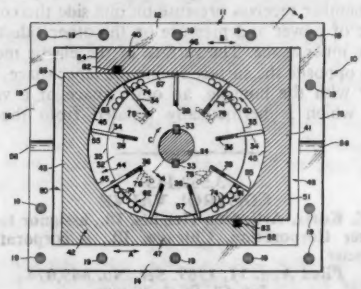
An encapsulated refrigeration motor-compressor hermetically sealed in a capsule and in which the motor has a vertically disposed hollow motor shaft to which is attached a length of tubing in communication with the bore of the shaft defining a first centrifugal oil pump. A second length of tubing is mounted circumferentially and axially of the first-mentioned length of tubing spaced outwardly therefrom defining a second centrifugal oil pump driven in conjunction with the first pump from the common motor shaft.



3,560,118
ROTARY MOTOR OR PUMP

Derso W. Palachik, 16 Bridlington St., Scarborough 722, Ontario, Canada

Filed June 11, 1969, Ser. No. 832,085
Int. Cl. F01c *21/16*
U.S. Cl. 418—26 **14 Claims**



A deformable stator formed of opposed essentially semi-circular linearly movable sections having overlapping extensions on either side of a radially vaned rotor enclosure a pair of variable volume meniscoidal stator chamber sections whereby a fluid pressure unit is provided utilizable either as a hydraulic motor capable of variable torque output or a pump of predetermined pressure output responsive to automatic control of its volumetric displacement rate.

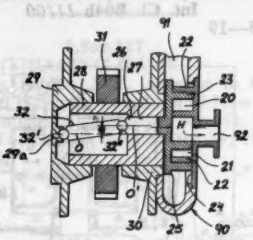
3,560,119
FLUID PUMP OR MOTOR

Werner Busch, Munich, Allach, and Paul Hufnagel, Munich, Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany, a corporation of Germany

Filed Dec. 18, 1968, Ser. No. 784,841
Claims priority, application Germany, Dec. 18, 1967, P 16 53 815.1
Int. Cl. F02b *53/00*; F04c *17/02*; B23f *23/08*
U.S. Cl. 418—55 **18 Claims**

Two relatively displaceable members are formed with at least two interfitting spiroidal peripheral wall elements of like pitch, angularly and radially offset to contact one

another along at least one pair of diametrically opposite locations simultaneously, defining together with adjoining sidewalls one or more pairs of chambers of progressively varying volume upon a relative orbiting of their centers



with substantial maintenance of their relative angular orientation whereby the points of contact shift along their peripheries, alternately opening each chamber toward an outer and an inner port.

3,560,120

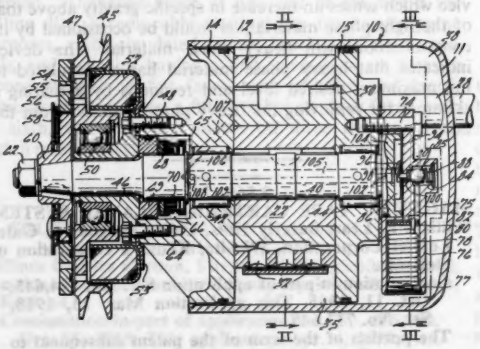
ROTARY COMPRESSOR

Edwin L. Gannaway and Robert M. Draper, Sidney, Ohio, assignors to Copeland Refrigeration Corporation, Sidney, Ohio, a corporation of Michigan

Continuation of application Ser. No. 713,581, Mar. 18, 1968. This application Sept. 9, 1968, Ser. No. 767,030

Int. Cl. F04c *29/02;* **F04d** *29/06*

U.S. Cl. 418—84 **4 Claims**



A vane-type rotary compressor is housed in a cylindrical cup-shaped sheet metal housing shell, the compressor assembly comprising three main body sections of generally cylindrical form including a cylindrical stator section sandwiched between inner and outer covering sections sealed in the shell and one forming an outer end closure which defines a bearing support, a seal chamber, and a support for a driving clutch and pulley, the internal cover section being spaced from the closed rear wall of the shell and acting as a rear bearing support and also as a partition for a combined oil sump and high pressure discharge chamber and also supporting the lubricant feeding and control means and the suction and discharge conduits. The lubricating means comprises a capillary tube for feeding oil from the sump and a centrifugally operable valve which closes off escape of oil from the sump when the compressor is not running. The vanes are provided with vent channels to the vane pockets. A section of the stator wall which is engaged by the vanes in the area defining the seal between the high and low pressure regions is concentric and has a close fit with the rotor, to provide a seal of substantial angular extent as distinguished from a tangent seal between the rotor and stator.

3,560,121

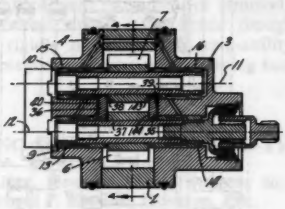
GEAR PUMP WITH MOVABLE ELEMENT HAVING CONTIGUOUS CYCLIC UNLOADING SUPPRESSION MEANS

Godwin L. Noell, Middletown, Conn., assignor to Chandler Evans Inc., West Hartford, Conn., a corporation of Delaware

Filed Feb. 28, 1969, Ser. No. 803,358

Int. Cl. F01c *1/18;* **F02b** *53/00;* **F04c** *15/00*

U.S. Cl. 418—129 **10 Claims**



A gear pump having first and second intermeshing gears capable of pumping fluids containing highly abrasive contaminants, separate pivotably movable elements engaging the periphery of said first and second gears respectively adjacent the pump discharge such that high pressure is introduced into the gear tooth intertices next to the innermost gear teeth prior to the disengagement of said gear teeth to thereby maintain continuous peripherial sealing engagement of the outboard extremity of each movable element under all pump operating conditions.

ERRATA

For Classes 83—13 thru 214—522 see:
Patent Nos. 3,560,123 thru 3,560,133

3,560,122

CANDLE CONTAINING WICK OF NOVEL COMPOSITION

Richard D. Cassar, West Chester, Pa., assignor to Sun Oil Company, Philadelphia, Pa., a corporation of New Jersey

No Drawing. Filed July 9, 1969, Ser. No. 840,531

Int. Cl. F23d *13/16*

U.S. Cl. 431—288 **3 Claims**

A candle wick having the composition defined herein, and whose cross-sectional area when compared to the cross-sectional area of the candle it is contained in has a ratio between 0.042 and 0.250, is useful in place of the costly and difficult-to-make cotton wicks used in candles. The wick composition comprises 65 to 98.8 weight percent paraffin wax, 0.1 to 10 weight percent palygorskite particles and 1.1 to 25 weight percent of polyethylene having a weight average molecular weight in the range of 500,000 to 6,000,000, the latter two being uniformly distributed in the wax.

3,560,123

METHOD AND APPARATUS FOR AUTOMATICALLY SHEARING METAL PLATES BY SUPERSONIC FLAW DETECTION

Shozo Sekino, Osamu Araki, and Yukito Sasaki, Kitakyushu, Japan, assignors to Yawata Iron & Steel Co., Ltd., and Mitsubishi Electric Corporation, Tokyo, Japan

Filed July 3, 1968, Ser. No. 742,247

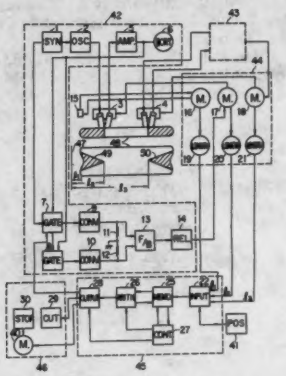
Claims priority, application Japan, July 6, 1967, 42/43,489

Int. Cl. B26d *5/00*

U.S. Cl. 83—13 **3 Claims**

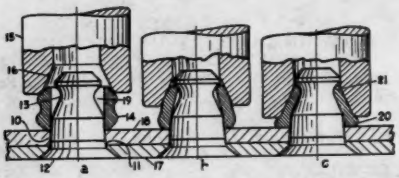
A method and apparatus for automatically shearing metal plates by supersonic flaw detection, wherein the location of flaw present in a metal plate as hot-rolled and

still in the state of high temperature is detected by means of supersonic flaw detection, whereby the distance of this flaw and that of the good material part from a standard



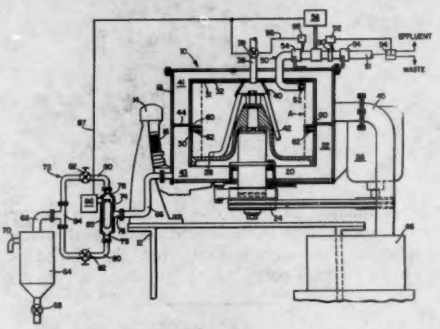
position are measured, the measured values are sent to a computer to determine the optimum shearing position and an instruction is given from the computer to a shearing machine so that a planned shearing may be carried out.

3,560,124
RIVET FASTENER
Emric Bergere, 2324 Nottingham Ave., Los Angeles, Calif. 90027
Filed Nov. 1, 1966, Ser. No. 595,562
Int. Cl. F16b *19/05*
U.S. Cl. 85—7 **7 Claims**



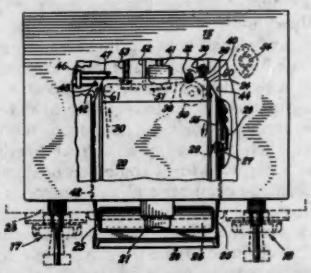
A fastener for joining structural members is disclosed which markedly improve the fatigue life of the structural members. The fastener includes a pin having a head and a shank adapted to be inserted through aligned apertures in the structural members. The shank includes a tapered portion, a collar-receiving portion at the end opposite the head and an intermediate portion connecting the tapered portion and the collar-receiving portion. The tapered portion of the shank is adapted to seat, with an interference fit, in tapered parts of the apertures so that when the pin is set in place under tension, the parts of the structural members surrounding the tapered portion of the pin are subjected to compressive preloads higher than the tensile loads to be applied to the structural members during utilization. The collar has planar ends, frusto-conical end sections and a sinuous exterior surface between the end sections. The collar is swaged about and within an annular depression in the collar-receiving portion of the pin by means of a setting tool cooperating with one of the frusto-conical end sections thereby seating the pin and subjecting it to substantial tensile load. The desired compressive bearing preload is thereby produced in the parts of the structural members surrounding the tapered portion of the pin.

3,560,125
CENTRIFUGE APPARATUS
Charles Edward Trump, Bedford, N.Y., assignor to Pennwalt Corporation, a corporation of Pennsylvania
Filed July 8, 1968, Ser. No. 743,075
Int. Cl. B04b *11/00*
U.S. Cl. 233—19 **6 Claims**



A heavy phase material, separated from a light phase material and accumulated on the peripheral wall of a centrifuge bowl, is removed from the bowl by a skimmer in response to sensing action of a detector. The latter includes an overflow conduit extending inwardly from an opening in the bowl wall to the maximum desired level of the heavy phase material. The conduit conducts a sample of the material at such level to a gravimetric device which senses an increase in specific gravity above that of the light phase material, as would be occasioned by its contamination with heavy phase material. The device indicates that heavy phase material has accumulated to the maximum desired level and responds by actuating a skimmer for removing the heavy phase material from the bowl.

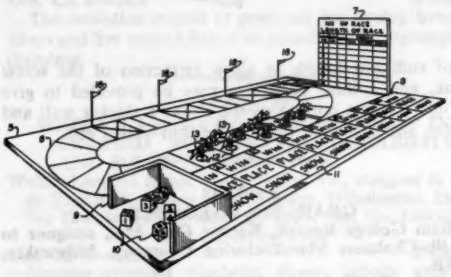
3,560,126
MAGNETIC TAPE CARTRIDGE PLAYER SYSTEM
William P. Lear, Beverly Hills, Calif., assignor to Gates Learjet Corporation, Wichita, Kans., a corporation of Delaware
Continuation-in-part of application Ser. No. 494,645, Oct. 11, 1965. This application Mar. 13, 1968, Ser. No. 712,648
The portion of the term of the patent subsequent to Oct. 1, 1985, has been disclaimed
Int. Cl. G11b *23/06;* **B65h** *17/48*
U.S. Cl. 242—55.19 **11 Claims**



The player accommodates magnetic tape cartridges with the tape arranged in endless array. The cartridge is in rectangular form, and is inserted in an opening of the player for direct engagement in the play mode. A recess or V-notch in one side of the cartridge coacts with a prepositioned retention member biased into the opening. The member engages the notch to provide a substantial forward force component that presses an exposed tape portion

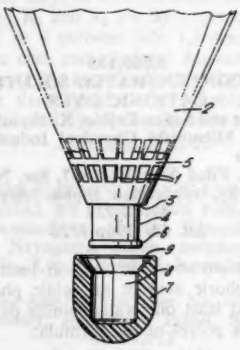
against the drive capstan and for transcription by a pick-up head, and simultaneously provides a lateral force component that presses the cartridge against an opposite side guide that holds the cartridge in stable play position.

3,560,127
RACING GAME
Joseph Imperato, Seldon, N.Y., assignor to Riders Up, Inc., Seldon, N.Y., a corporation of New York
Continuation-in-part of application Ser. No. 728,526, May 13, 1968. This application Oct. 29, 1968, Ser. No. 771,488
Int. Cl. A63f *3/02*
U.S. Cl. 273—134 **1 Claim**



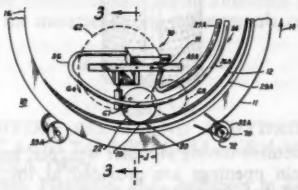
A game apparatus for simulating a horserace, said apparatus comprising a board having a track printed thereon, U-shaped fence at one end of the board for rolling dice, a removable starting gate for handicapping purposes, eight simulated horses bearing different symbols, and five dice having a first symbol on six faces, a second symbol on five faces, each of third and fourth symbols on four faces, a fifth symbol on three faces, each of sixth, and seventh symbols on three faces, and an eighth symbol on two faces.

3,560,128
SHUTTLECOCK AND METHOD OF MAKING THE SAME
William Charles Carlton, Fitches, Finchingfield, England, assignor to Carlton Sports Company Limited, London, England
Continuation-in-part of application Ser. No. 496,890, Oct. 18, 1965. This application Apr. 4, 1968, Ser. No. 725,555
Claims priority, application Great Britain, Nov. 6, 1964, 45,276/64
Int. Cl. A63b *67/18*
U.S. Cl. 273—106 **5 Claims**



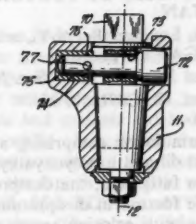
A shuttlecock having a flexible skirt including a flared array of stems, a vane area and a stem-extension collar, is moulded from nylon, the assembly forming a one-piece structure. The stem-extension collar is cylindrical but a curled or straight annular flange, rim or enlargement is formed on its outer end, either in the mould or preferably, after removal therefrom. A striking cap made of expanded polyvinyl chloride is slipped over the outer end of the stem-extension collar. The cap then starts to shrink and as a result of this shrinkage a groove is formed on the inner walls of the cap, the annular flange, rim or enlargement then fitting snugly in said groove and locking the cap against any rectilinear movement or removal. But the cap may be rotated on its axis, hence though firmly secured is not rigidly mounted. This spin-ability of the cap is an advantageous feature when playing badminton.

3,560,129
ROTATING ARM ASSIST FOR RING-TYPE BALL ELEVATORS
Joe Diaz, Houston, Tex., assignor to Michael P. Breston, Houston, Tex.
Filed Oct. 14, 1968, Ser. No. 767,203
Int. Cl. A63d *5/02*
U.S. Cl. 273—49 **7 Claims**



This invention relates to conventional, automatic, ring-type ball elevators, used in bowling alleys. The elevator has a ring defining a cylindrical surface movable continually through a circular path extending transversely of an alley pit. The lower extremity of the path constitutes a ball-pickup station. A stationary, arcuate track is radially displaced a distance from the periphery of the cylindrical surface for guiding and elevating the ball. The improvement of this invention provides a rotating, ball-engaging arm within the cylindrical volume defined by the cylindrical surface. The arm positioned at a suitable distance from the cylindrical surface, near the ball-pickup station, engages and assists the ball to enter the space between the track and the cylindrical surface.

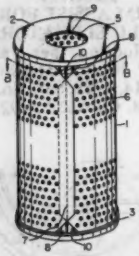
3,560,130
LOCK CORE SERVICE VALVE
George Horhota, 713 Stanley Terrace, Roselle, N.J. 07203
Continuation-in-part of application Ser. No. 658,855, Aug. 7, 1967. This application Jan. 15, 1968, Ser. No. 704,501
Int. Cl. F16k *35/06*
U.S. Cl. 251—111 **4 Claims**



A valve having a housing and a valve core or member is disclosed which can be locked by a locking pin, espe-

cially a Smith-Morse pin. The locking pin passes through the valve core and presents rotation of the core relative to the housing in one position and allows rotation thereof in another position.

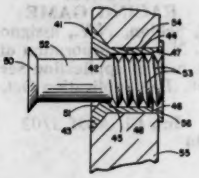
3,560,131
FILTER ELEMENT
Kokichi Yotsumoto, Sagamihara-shi, Japan, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan
Filed Dec. 31, 1968, Ser. No. 788,242
Claims priority, application Japan, Jan. 11, 1968, 43/1,264
Int. Cl. B01d *27/08*
U.S. Cl. 210—484 **4 Claims**



A filter element having an outer wrapper, and improvement wherein openings are provided at the upper and lower ends of the joint of the outer wrapper.

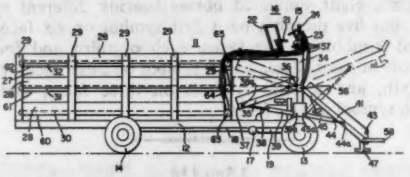
3,560,132
ARRANGEMENT FOR CAPTIVE SCREW
Bulent Gulistan, Malibu, Calif., assignor to Deutsch Fastener Corp., Los Angeles, Calif., a corporation of California
Continuation-in-part of application Ser. No. 697,361, Jan. 12, 1968, which is a division of application Ser. No. 590,601, Oct. 31, 1966. This application Nov. 22, 1968, Ser. No. 778,262
The portion of the term of the patent subsequent to Mar. 24, 1987, has been disclaimed
Int. Cl. F16b *41/00*
U.S. Cl. 151—69 **5 Claims**

A captive screw arrangement including a sleeve through which is extended a screw blank, after which the portion of the shank projecting beyond the sleeve is provided with screw threads of a larger major diameter than the bore of the sleeve. A second bore of larger diameter is included, resulting in a thin-walled portion enabling a flange to be bent outwardly for attaching the sleeve to a workpiece. The interior of the sleeve beyond the first bore may



be of sufficient length to allow retraction of the screw shank, and a third bore also may be provided to give the intermediate portion of the sleeve a thicker wall and greater strength than that at the thin-walled end.

3,560,133
GRAIN BIN UNLOADER
William George Ryczek, Kansas City, Mo., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed July 28, 1969, Ser. No. 845,294
Int. Cl. B60p *1/42*
U.S. Cl. 214—522 **6 Claims**



A foldable auger provided with a spirally wound springlike member attached at one end thereof to the central portion of an auger shaft of a swingable auger with the other end of the springlike member being slidably received within the hollow shaft of the nonswinging auger for guiding said swinging auger into engagement with the nonswinging auger when moving same to operative position.

CHEMICAL

3,560,134
AZO, VAT AND FLUORESCENT DYES DUSTPROOFED WITH A LIGHT MINERAL OIL AND A FATTY ACID OF POLYOXYALKYLATED SORBITAN
Clemens Streck, Loudonville, N.Y., assignor to GAF Corporation
No Drawing. Filed June 19, 1967, Ser. No. 647,203
Int. Cl. C09b *67/00*
U.S. Cl. 8—34 **4 Claims**

A dustproofing formulation comprising a mixture of a low viscosity mineral oil and a polyoxyalkylated sorbitan ester of a long chain fatty acid, the dustproofing formulations being suitable for use in dustproofing of powders contemplated for use with coloring agents which are acceptable for use in cosmetics and foodstuffs, or wrapping materials which may come in contact with foodstuffs and cosmetics.

3,560,135
NOVEL CONCENTRATED SOLUTION OF CATIONIC DYES
Wataru Yamaya and Sadao Fujino, Kitakyushu-shi, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan
No Drawing. Filed May 17, 1967, Ser. No. 639,020
Claims priority, application Japan, May 24, 1966, 41/32,727
Int. Cl. D06p *1/20*
U.S. Cl. 8—39 **8 Claims**

The dye solution comprises (1) at least one cationic dye, (2) phosphoric acid or an acidic phosphoric acid ester and (3) at least one water-soluble organic solvent. The solvent is a polyol of the formula:

$$HO{\cdot}R(G{\cdot}R')n{\cdot}OH$$

wherein R and R' denote an alkylene group having 2 to 3 carbon atoms or a 2-oxy-propyl group, *n* denotes an

integer which is zero to 2 and G denotes an oxygen atom. When *n* is 1, G may also be a sulphur atom, a sulphonyl group or a >N·COH group; a lower alkyl ether of said polyol; dimethyl sulphoxide; or dimethyl formamide.

3,560,136

HAIR DYEING WITH SUBSTITUTED NITROPHENYLENE-DIAMINES

Gregoire Kalopissis, Paris, and Andree Bugaut, Boulogne-sur-Seine, France, assignors to L'Oreal, Paris, France

No Drawing. Filed Dec. 1, 1966, Ser. No. 598,179
Claims priority, application Luxembourg, Dec. 3, 1965, 49,990; Apr. 13, 1966, 50,894; Oct. 19, 1966, 52,201
Int. Cl. A61k *7/12*
U.S. Cl. 8—10.1 **5 Claims**

The invention relates to processes for dyeing keratinic fibers and live human hair with substituted nitrophenylene-diamines.

3,560,137

WHOLLY AROMATIC POLYAMIDES OF INCREASED HYDROLYTIC DURABILITY AND SOLVENT RESISTANCE

Walter Leopold Hahn, Waynesboro, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 15, 1967, Ser. No. 660,602
Int. Cl. D06m *9/00*
U.S. Cl. 8—115.5 **6 Claims**

Heating crimped synthetic, linear, wholly aromatic polyamide and polyimide fibers to a temperature in the range of 275° C. to 400° C. for 1 to 10 minutes increases their hydrolytic durability and solvent resistance.

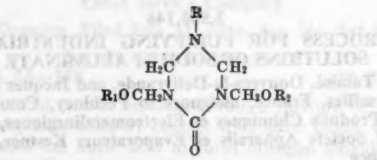
3,560,138

DYED CELLULOSIC FABRIC TREATED WITH DMDHEU IN COMBINATION WITH A METHYLOLATED TRIAZONE

Myrtle Joanne Spangler, Danville, Va., assignor to Dan River Inc., Danville, Va., a corporation of Virginia

No Drawing. Filed Aug. 1, 1967, Ser. No. 657,512
Int. Cl. D06m *13/14, 13/40*; D06p *5/06*
U.S. Cl. 8—116.3 **5 Claims**

Improved textile creaseproofing compositions are prepared by mixing a triazone having the following general formula:



where R, is an alkyl or hydroxyalkyl radical having 1 to 6 carbons and R_1 and R_2 are hydrogen or an alkyl radical having 1 to 4 carbons with 1,3-dimethylol-4,5-dihydroxyethylene urea and alkylated derivatives thereof and an acid catalyst. The improved properties of these compositions make them particularly suitable for imparting crease-resistance to fabrics treated with sensitive dyes.

3,560,139

PROCESS FOR IMPROVING CELLULOSE TEXTILE MATERIAL BY ALKALINE TREATMENT

Toshihiko Suminokura, Yojuro Kyogoku, and Kazuo Sekiguchi, Neyagawa, Japan, assignors to Kurashiki Spinning Co., Ltd., Kurashiki, Japan, a corporation of Japan

Filed Aug. 18, 1967, Ser. No. 661,564
Claims priority, application Japan, Sept. 6, 1966, 41/59,072
Int. Cl. D06m *1/10*
U.S. Cl. 8—125 **4 Claims**

Cellulose textile material is treated with a solution having a high caustic soda concentration of 25–35% at room temperature in the first step, and thereafter is treated with a solution of a low caustic soda concentration of about 10% at room temperature in the second step, and thereby the cellulose textile material swells much more than conventional one-step treatment with a caustic soda solution.

If the above two-step method is used without tension, the stretchability, moisture adsorption and dyeing capacities of the cellulose textile material will be improved; if with tension, its luster and strength will be improved.

3,560,140

METHOD OF TREATING TEXTILE MATERIALS WITH LIQUID AMMONIA

J & P Coats Limited, Glasgow, Scotland
Robert M. Galley, Paisley, Scotland, assignor to

No Drawing. Filed Nov. 29, 1967, Ser. No. 686,729
Claims priority, application Great Britain, Dec. 2, 1966, 53,960/66
U.S. Cl. 8—125 **7 Claims**
Int. Cl. D06m *1/02*

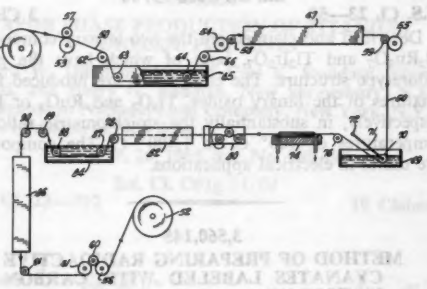
Cellulosic textile materials of improved strength are obtained by treatment with liquid ammonia followed by stretching the material during the ammonia removal step.

3,560,141

ALDEHYDE, ALUM AND DIHYDROXYBENZOIC ACID TANNED COLLAGEN ARTICLES PRODUCTION

John Kurilla, Plainfield, N.J., assignors to Ethicon, Inc., a corporation of New Jersey

Continuation of application Ser. No. 594,076, Nov. 14, 1966, which is a continuation-in-part of application Ser. No. 284,049, May 29, 1963. This application Aug. 2, 1968, Ser. No. 758,644
Int. Cl. A61l *17/00*
U.S. Cl. 8—127.6 **12 Claims**



The invention involves tanning a collagen tape made of filament spun from hides disintegrated by swelling by tanning the tape with an aldehyde, a resorcyclic acid, and an aluminum salt. Formaldehyde, acetaldehyde, glyoxal, succinaldehyde and malonic aldehyde are enumerated as the aldehyde while alum, basic aluminum acetate, and alumino formo-acetate are the aluminum salts used. In one example, the tape is tanned in a solution of 1 to 2% resorcyclic acid, .05% EDTA, and 1% $NaHSO_3$ or formaldehyde sulfoxylate. The tape is dried, and then retanned in a bath of .5 to 2.5% alumino formo-acetate and .05 to 4% formaldehyde at pH 2 to 4.7. The tape is dried and false twisted.

3,560,142

USE OF QUATERNARY AMMONIUM COMPOUNDS IN THE DYEING OF POLYACRYLONITRILE WITH BASIC DYESTUFFS

Robert Christian Keller, Basel, and Hilmar Roedel, Basel-Land, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

No Drawing. Filed Dec. 11, 1967, Ser. No. 689,354
Claims priority, application Switzerland, Dec. 28, 1966, 18,629/66
Int. Cl. D06p 5/06
U.S. Cl. 8—172 9 Claims

Benzylated or naphthylated polyalkylene polyamines quaternized with dimethyl sulphate are used as adjuvants in dye baths containing a basic dyestuff in order to regulate the uptake of the dye on fibrous materials consisting of or containing polyacrilonitrile fibres or threads.

3,560,143

METHOD OF PROVIDING AN INERT ATMOSPHERE WITHIN AN ELASTOMERIC AIR CHAMBER

Lawrence R. Sperberg, 6740 Fiesta Drive, El Paso, Tex. 79912

No Drawing. Continuation of application Ser. No. 602,123, Dec. 16, 1966. This application Oct. 18, 1967, Ser. No. 676,076
Int. Cl. B01d 53/00
U.S. Cl. 23—2 7 Claims

Removal of oxygen from air in elastomeric chambers comprising adding to the air chamber of the elastomeric chamber an agent consisting essentially of hydrazine and an inert diluent.

3,560,144

PYROCHLORE-TYPE TERNARY OXIDES $Tl_2Ru_2O_7$ AND $Tl_2Ir_2O_7$

Arthur W. Sleight, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 28, 1968, Ser. No. 741,220
Int. Cl. C01b 15/00
U.S. Cl. 23—50 3 Claims

Described and claimed are the two ternary compounds $Tl_2Ru_2O_7$ and $Tl_2Ir_2O_7$, both of which have the pyrochloretype structure. The compounds are produced from mixtures of the binary oxides, Tl_2O_3 and RuO_2 or IrO_2, respectively, in substantially the stoichiometric ratios at temperatures of 400° C. to 1,400° C. The compounds are useful in electrical applications.

3,560,145

METHOD OF PREPARING RADIOACTIVE CYANATES LABELED WITH CARBON ISOTOPE ^{14}C

Josef Ratusky and Richard Tykva, Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

No Drawing. Filed Sept. 26, 1967, Ser. No. 670,779
Claims priority, application Czechoslovakia, Sept. 28, 1966, 6,222
Int. Cl. C01c 3/00; C09k 3/00

Radioactive cyanates labeled with carbon isotope ^{14}C are produced by placing a non-radioactive cyanate into a radioactive carbon dioxide $^{14}CO_2$ atmosphere at a temperature sufficiently high to cause an exchange reaction by which ^{14}C from $^{14}CO_2$ will change place with non-radioactive carbon of the cyanate starting material. The reaction temperature preferably will be at or above the melting point of the cyanate and generally between about 100° C. and 380° C.

3,560,146

PROCESS FOR IMPROVING THE STEREOSPECIFICITY OF CATALYTIC COMPONENTS COMPRISING $TiCl_3$

Luciano Luciani and Gianfranco Corsi, Ferrara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed Aug. 4, 1967, Ser. No. 658,319
Claims priority, application Italy, Aug. 9, 1966, 18,418/66
Int. Cl. C01b 9/02
U.S. Cl. 23—87 6 Claims

Process for improving stereospecificity of $TiCl_3$ containing catalyst wherein $TiCl_3$ composition is obtained by reducing $TiCl_4$ with Al or H_2 and thereafter activating by vigorous milling at ambient temperature for from about 4 to 24 hours, this process comprising thereafter intimately admixing $TiCl_3$ composition with from about 1–12% by weight thereof of a halogenated or non-halogenated aromatic hydrocarbon at below 60° C. for between about 30 minutes and 4 hours.

3,560,147

METHOD FOR THE PRODUCTION OF CONCENTRATED NITROGEN OXIDE

Witold Janiczek, Henryk Ryszawy, and Antoni Gajewski, Tarnow, Poland, assignors to Instytut Nawozow Sztucznych, Pulawy, Poland

Filed Apr. 12, 1968, Ser. No. 720,997
Claims priority, application Poland, Apr. 15, 1967, P 120,022
Int. Cl. C01c 1/18; C01b 21/26
U.S. Cl. 23—103 5 Claims

In a process wherein NH_3 is oxidized with oxygen and water vapor to form nitric oxide and water vapor, the water vapor upon being condensed, carries with it, a small amount of nitric oxide which forms diute HNO_3. The dilute HNO_3, otherwise useless, is neutralized with NH_3 to form dilute NH_4NO_3 which is then concentrated using the heat evolved during its formation.

3,560,148

PROCESS FOR PURIFYING INDUSTRIAL SOLUTIONS OF SODIUM ALUMINATE

Louis Tamisé, Douvres-la-Delivrande, and Jacques Millet, Versailles, France, assignors to Pechiney, Compagnie de Produits Chimiques et Electrometallurgiques, Paris, and Societe Appareils et Evaporateurs Kestner, Lille, France

No Drawing. Filed Mar. 15, 1968, Ser. No. 713,315
Claims priority, application France, Mar. 20, 1967, 99,395
Int. Cl. C01f 7/06
U.S. Cl. 23—143 6 Claims

A process for the removal of sodium carbonate from aluminate solutions generated during the attack on bauxite with caustic soda for the recovery of alumina, wherein, after the solution is hydrolyzed and the precipitated aluminum trihydrate separated, the solution is processed through a series of evaporators wherein the concentration and temperature are increased and a series of expansions in which the suspension is concentrated and cooled to a temperature within the range of 50° to 60° C. and a concentration of 300–330 grams per liter of total Na_2O with the accompanying precipitation of sodium carbonate as fine crystals and adding a concentrated solution of caustic soda to the suspension to raise the total Na_2O content to about 350 grams per liter whereby, without subsequent heating, the sodium carbonate crystals are increased in size for easier separation.

3,560,149

PROCESS FOR TREATING PHOSPHATE ROCK

Joseph W. Markey and Ernest C. Camp, Jr., College Park, Ga., assignors to Cities Service Company, a corporation of Delaware

Filed Apr. 29, 1968, Ser. No. 725,017
Int. Cl. C01b 25/18
U.S. Cl. 23—165 11 Claims

Phosphoric acid can be prepared from phosphate rock by acidulating the rock from about 75–85% by weight nitric acid to form an acidulate and thereafter precipitating anhydrous calcium nitrate by raising the nitric acid content of the acidulate. The precipitated anhydrous calcium nitrate can be decomposed in the presence of a nitrogen oxide containing atmosphere and the product gases can be used to form nitric acid which can be recycled to the acidulation or anhydrous calcium nitrate precipitation steps. The decomposition gases can also be recycled directly to form nitric acid in situ.

By decomposing the precipitated calcium nitrate in the presence of a nitrogen oxide-containing atmosphere, a product gas stream containing a high proportion of nitrogen and a relatively low proportion of undesired inerts may be obtained. The calcium nitrate may be decomposed in the presence of a bed of fluidized solids. The bed may comprise by-product lime that is heated and recycled to the decomposition zone. A portion of the product gas may be recycled to the decomposition zone at a bed fluidizing velocity. The product gases, comprising nitrogen oxides and oxygen, are particularly suitable for use in the formation of concentrated nitric acid. This acid may conveniently be recycled to the acidulation or anhydrous calcium nitrate separation operations. The product gases may also advantageously be recycled directly to the acidulation mixture so as to form nitric acid in situ.

3,560,150

SEPARATION OF NITRIC AND PHOSPHORIC ACIDS

Joseph W. Markey, College Park, Ga., assignor to Cities Service Company

No Drawing. Filed July 31, 1968, Ser. No. 748,966
Int. Cl. C01b 21/46, 25/22
U.S. Cl. 23—158 10 Claims

Nitric acid can be separated from a mixture of nitric and phosphoric acids by contact with nitric oxide, which reacts with the nitric acid to form nitrogen dioxide gas and water. The nitrogen dioxide gas is removed so that a phosphoric acid solution containing a greatly reduced nitrite concentration can be obtained. The nitrogen dioxide gas stream can be employer to produce additional quantities of nitric acid. The mixture of nitric and phosphoric acids can be obtained from the nitric acid acidulation of phosphate rock followed by removal of calcium nitrate.

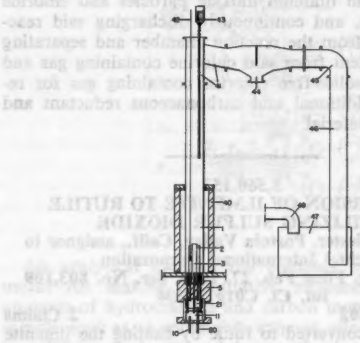
If the nitric oxide stream as formed is to be cooled prior to contacting the acid mixture and this stream contains oxygen, it should be quickly quenched to below about 500° C. to minimize the formation of nitrogen dioxide. One convenient source of a nitric oxide-containing gas stream is the thermal decomposition of calcium nitrate at a temperature of about 650° C. The nitric oxide may also be obtained by the reaction of air and ammonia gas at a temperature of about 900–1,000° C. in the presence of an oxidation catalyst. Since oxygen will generally be present in each of these product gas streams, a rapid quenching to below about about 500° C. is necessary in order to minimize the reaction of oxygen with the nitric oxide.

3,560,151

PROCESS FOR THE PRODUCTION OF FINELY DIVIDED SILICON DIOXIDE

Georg Vogt, Kempten, Allgau, Gunther Wiebke, Unterpfaffenhofer-Germering, and Ludwig Eberle, Sankt Mang, near Kempten, Germany, assignors to Elektroschmelzwerk Kempten G.m.b.H., Munich, Germany

Filed Aug. 1, 1967, Ser. No. 657,552
Claims priority, application Germany, Aug. 5, 1966, E 32,230
Int. Cl. C01b 33/18
U.S. Cl. 23—182 2 Claims



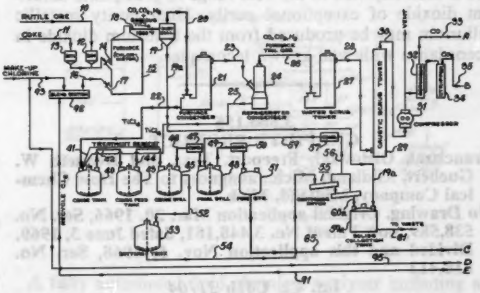
Silicon dioxide in finely subdivided form is produced by passing a mixture of silicon halides and oxygen through a turbulent, or fluidized bed of heated particles of solids which react with one or both of the gases passed therethrough. Examples of such solids include silicon carbide, ferrosilicon, silicon, and the like. The bed is preferably fluidized, and is maintained at a temperature of the order of at least 1000° C.

3,560,152

VAPOR PHASE PRODUCTION OF TITANIUM DIOXIDE PIGMENTS

Willard W. Dunham, Jr., and Carl K. Stoddard, Westfield, and Harry G. Rodman, New Shrewsbury, N.J., assignors to National Lead Company, New York, N.Y., a corporation of New Jersey

Filed Nov. 26, 1965, Ser. No. 509,999
Int. Cl. C01g 23/04
U.S. Cl. 23—202 19 Claims



Process and apparatus for the vapor phase production of titanium pigments as a continuous operation, starting with titanium bearing raw materials, such as titanium

ore, including conversion thereof to $TiCl_4$ by chlorinating in the presence of a solid carbonaceous reductant at elevated temperature with evolution of said $TiCl_4$ in admixture with CO, CO_2 and other gaseous and solid constituents, followed by separation of the solids, separation of the $TiCl_4$ from other gaseous constituents and purification thereof, purification of the remaining gaseous constituents to remove therefrom constituents other than carbon dioxide and carbon monoxide, separating these two to produce a purified carbon monoxide, thereupon continuously reacting the purified $TiCl_4$ in a vaporized state in a closed reaction chamber with a free oxygen containing gas at elevated temperature maintained by burning said carbon monoxide with a portion of said oxygen to form titanium dioxide particles and chlorine containing gas, and continuously discharging said reaction products from the reaction chamber and separating the solids content from said chlorine containing gas and recycling the solids-free chlorine containing gas for reaction with additional said carbonaceous reductant and titanium raw material.

3,560,153

CONVERSION OF ILMENITE TO RUTILE UTILIZING SULFUR DIOXIDE

Nevin K. Hiester, Portola Valley, Calif., assignor to Bechtel International Corporation

No Drawing. Filed Feb. 27, 1969, Ser. No. 803,109
Int. Cl. C01g *23/04*
U.S. Cl. 23—202 2 Claims

Ilmenite is converted to rutile by heating the ilmenite in the presence of sulfur dioxide and a reductant to sulfidize the iron content followed by leaching of the sulfidized ilmenite with sulfurous acid. In a subsequent roasting step, sulfur dioxide is released which can be recycled to the sulfidizing step.

3,560,154

PROCESS FOR PREPARING ALKALI METAL ORTHOTELLURATE AND TELLURIUM DIOXIDE

Alexander Arno Jueschke and William J. Wendt, Salt Lake City, Utah, assignors to Kennecott Copper Corporation, New York, N.Y., a corporation of New York

Continuation-in-part of application Ser. No. 699,282, Dec. 14, 1967. This application May 28, 1969, Ser. No. 830,924
Int. Cl. C01b *19/00;* C01d *11/00;* C22b *7/04*
U.S. Cl. 23—209 17 Claims

Alkaline solutions containing tellurium and selenium but substantially free of heavy metal ions, are treated with strong oxidants to precipitate high purity alkali metal orthotellurate at temperatures below the atmospheric boiling point. The orthotellurate may be further treated by contacting it with a reductant to convert tellurium from the +6 valence state to its +4 valence state. The pH is then adjusted to the acid range to precipitate tellurium dioxide of exceptional purity. High purity metallic tellurium may be produced from the tellurium dioxide in accordance with well-known techniques.

3,560,155

GRAPHITE PRODUCT

Franciszek Olstowski, Freeport, Tex., and Kenneth W. Guebert, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Mar. 30, 1966, Ser. No. 538,589, now Patent No. 3,448,181, dated June 3, 1969. Divided and this application Nov. 5, 1968, Ser. No. 810,413
Int. Cl. C01b *31/04*
U.S. Cl. 23—209.2 1 Claim

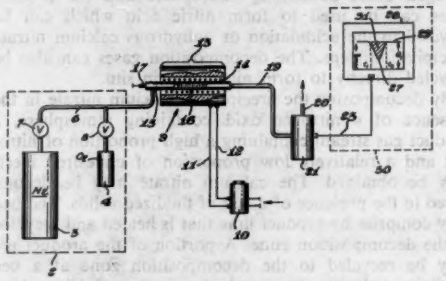
This invention is a new form of graphite flake. Such flakes are irregular in form, have a density of between 0.25 and 1.5 gm./cc. and are prepared by compressing individual particles of vermicular expanded graphite to the desired density. Masses of these flakes may be compressed to form cohered articles without the need of a binder.

3,560,156

DETERMINING THE OXYGEN DEMAND OF COMBUSTIBLE MATERIALS IN AQUEOUS DISPERSIONS

James L. Teal, Charles E. Hamilton, and Dennis A. Clifford, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

Filed May 3, 1965, Ser. No. 452,809
Int. Cl. G01n *31/12*
U.S. Cl. 23—230 6 Claims



Determining the oxygen demand of combustible materials in aqueous dispersions, comprising the steps of flowing a feed gas stream composed of an inert gas containing oxygen into a confined, heated combustion zone, at a constant rate. The feed gas stream is passed through a combustion supporting, porous catalyst bed in the combustion zone which is heated to a combustion supporting temperature and then is fed into a detector for small amounts of free oxygen. A small amount of a dilute aqueous dispersion of a combustible material is injected into the feed gas stream within the combustion zone upstream from the catalyst bed. The resulting gaseous product is then swept from the combustion zone into the oxygen detector by the continuing pressure of the feed gas stream. Since the feed gas stream contains only a small amount of oxygen, very small amounts of combustible materials in the aqueous dispersion produce a large percentage deviation in the oxygen content of the effluent gas from the combustion zone.

3,560,157

SURFACE ANALYSES

John Lynde Anderson, Orlando, Fla., assignor to Cleanometer Corporation

No Drawing. Continuation-in-part of application Ser. No. 506,566, Nov. 5, 1965, now Patent No. 3,412,247, which is a continuation-in-part of application Ser. No. 161,246, Dec. 21, 1961, now Patent No. 3,297,874, which in turn is a continuation-in-part of application Ser. No. 78,284, Dec. 27, 1960. This application Jan. 9, 1967, Ser. No. 607,872
Int. Cl. G01n *31/06;* G21h *5/00*
U.S. Cl. 23—230 8 Claims

A process for controlling or monitoring operations in which the production of chemically reactive materials is studied by selecting representative articles having surfaces modified by chemically reactive material and contacting those surfaces with a radioactive chemical that has at least one component that is selectively retained by at least a part of the material. The chemical is such that it will leave the material at an evaporative rate which is measured, and the amount of the retention of the chemical is followed by measuring the evaporative rate of the

chemical. Knowing through previous determinations precisely what evaporative rates attain from previously prepared surfaces having or being the desired and proper material, one thus controls the chemical reactions involved to avoid the issuance of articles bearing faulty material.

3,560,158

METHOD FOR ANALYSIS OF LABILE HYDROGEN CONTAINING COMPOUNDS

Royal H. Benson, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo., a corporation of Delaware

Filed Aug. 12, 1965, Ser. No. 479,109
Int. Cl. G01n *23/12*
U.S. Cl. 23—230 **12 Claims**

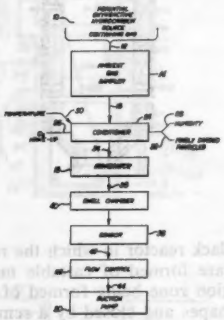
A method for analyzing for labile-hydrogen-containing compounds in mixtures by passing said mixture through a fixed phase of a tritium-containing substrate to effect exchange of said labile hydrogen with said tritium, detecting and measuring the radioactivity of the resulting tritium-containing compounds and using the radioactive measurement to determine the amount of the labile-hydrogen-containing compound in the mixture.

3,560,159

METHOD FOR DETECTING HIGHLY LOCALIZED SOURCES OF OXYREACTIVE HYDROCARBONS USING ULTRAVIOLET IRRADIATION

Alexander Goetz, Altadena, Calif., assignor to Alexander Goetz, as trustee of the Goetz family trust

Filed Sept. 26, 1967, Ser. No. 670,713
Int. Cl. G01n *21/12, 21/34*
U.S. Cl. 23—232 **19 Claims**



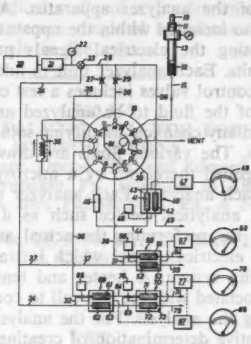
Detection of localized sources of oxyreactive hydrocarbons emitted into ambient gases is accomplished by converting in the gas the emitted molecularly disperse, normally nondetectable hydrocarbons into detectable particulates and inspecting the gas for the presence or absence of these particulates to reveal the presence or absence of such hydrocarbons in the gas. This invention provides extremely sensitive indication of such localized hydrocarbon sources as subsurface oil deposits, trespassing personnel and leaks in fluid container walls.

3,560,160

PULSE CALORIMETRIC DETECTOR

Keith P. Lanneau, Baton Rouge, La., assignor, by mesne assignments, to Tracor, Inc., Austin, Tex., a corporation of Texas

Filed July 11, 1968, Ser. No. 744,145
Int. Cl. G01n *31/08, 31/10*
U.S. Cl. 23—232 **34 Claims**



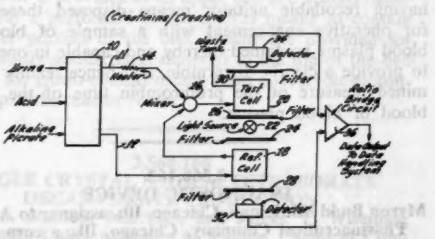
An analytical method and compact portable device useful for making quantitative measurements of the amounts of hydrocrabons and carbon monoxide in a gas sample, such as an automobile exhaust, effects the analysis by catalytic combustion of the sample. A selected volume of sample to be analyzed is pulsed into a chromatographic column wherein the hydrocarbon components are separated from the carbon monoxide, carbon dioxide, hydrogen and other components. The amounts of hydrocarbon and carbon monoxide are then separately determined by measuring the heat generated by each of these components as they are passed over a suitable combustion catalyst at specific temperatures to effect complete combustion. Analysis of carbon dioxide can be simultaneously accomplished by providing a third detector device for carbon dioxide determination.

3,560,161

AUTOMATED FLUID CHEMICAL ANALYZER

James E. Webb, Administrator of the National Aeronautics and Space Administration, with respect to an invention of James R. Clark, Glendale, Gerald A. Soffen, Los Angeles, Jerry L. Stuart, La Canada, and Joon H. Rho, Altadena, Calif.

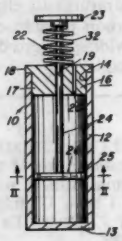
Filed Mar. 14, 1968, Ser. No. 713,162
Int. Cl. G01n *31/00, 33/16*
U.S. Cl. 23—253 **50 Claims**



A fully automated fluid chemical analyzer including at least one analyzer unit having the analytical equipment for performing an analysis of a fluid-reagant mixture and generating an electrical signal proportional to the quantity of a selected constituent in the fluid. The apparatus is

operated and controlled by an electronic logic and sequencer circuit which drives valve motors to connect a selector and a control valve in each analyzer unit to a fluid to be analyzed, reagent solutions, calibrate solutions, and rinse solutions. The solutions needed for the analysis of a fluid are self-contained within the apparatus. Also self-contained within the apparatus are all the drive motors and timing mechanisms necessary for automated operation of the analyzer apparatus. A data handling system is also included within the apparatus for receiving and processing the electrical signals produced by the analyzer units. Each analyzer unit in addition to the selector and control valves includes a test cell for receiving a mixture of the fluid to be analyzed and the chemical reagents and any chemical modifying solutions needed for the analysis. The various fluids are drawn into the test cell and expelled therefrom by a microsyringe pump included in each analyzer. Each analyzer unit contains an appropriate analytical device such as a colorimeter or fluorometer for performing the actual analysis and generating the electrical signal which is transmitted to the data handling system. A heater and temperature sensor may be associated with the test cell to control its temperature during the analysis. For the analysis of a fluid for the quantitative determination of creatine and creatinine, a single chemical reagent consisting essentially of picric acid, a metal hydroxide, and a metal salt stabilizer is used. The analysis is performed after the pH of the fluid being analyzed has been adjusted by the apparatus to from 0.1 to 1.

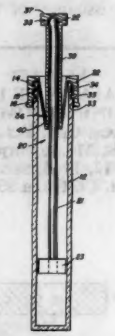
3,560,162
DIAGNOSTIC DEVICE
Myron Budd Mittleman, Chicago, Ill., assignor to Armour Pharmaceutical Company, Chicago, Ill., a corporation of Delaware
Filed Nov. 27, 1968, Ser. No. 779,531
Int. Cl. B01f *13/00, 3/00;* **G01n** *33/16*
U.S. Cl. 23—253 **10 Claims**



A manually operable diagnostic device useful in measring prothrombin time comprising a cylindrical member having recoilable agitator means disposed therewithin for operative engagement with a sample of blood or blood plasma contained thereby and capable in operation to provide a clearly discernible, and hence readily determined measure of the prothrombin time of the whole blood or blood plasma.

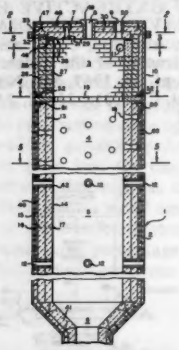
3,560,163
DIAGNOSTIC DEVICE
Myron Budd Mittleman, Chicago, Ill., assignor to Armour Pharmaceutical Company, Chicago, Ill., a corporation of Delaware
Filed Dec. 23, 1968, Ser. No. 786,317
Int. Cl. B01l *11/00;* **G01n** *33/16*
U.S. Cl. 23—253 **5 Claims**

A manually operable diagnostic device useful in measuring prothrombin time comprising a housing member having a special resilient connector associated therewith and connected to an agitator extendible within said member for operative engagement with a sample of blood or blood plasma contained thereby and capable in opera-



tion to provide a clearly discernible, and hence readily determined measure of the prothrombin time of the whole blood or blood plasma.

3,560,164
CARBON BLACK REACTOR
Charles R. Venable, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, a corporation of Delaware
Filed July 30, 1969, Ser. No. 845,959
Int. Cl. F27d *1/04*
U.S. Cl. 23—259.5 **6 Claims**

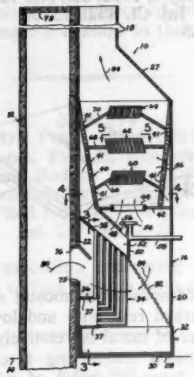


A carbon black reactor in which the reaction zone and quench zone are formed of castable materials with the feed introduction zone being formed of refractory brick and precast shapes and closed by a removable cover insulated to form a suspended arch construction.

3,560,165
FLUE SMOKE INCINERATOR
Gearl L. Beasley, 2136 W. Lindley, Oklahoma City, Okla. 73107
Filed Sept. 24, 1969, Ser. No. 860,735
Int. Cl. F23j *5/06*
U.S. Cl. 23—277 **4 Claims**

An upright housing forms a gas passageway communicating with the exhaust of a flue for receiving its heated gases. A heat exchanger, near the inlet end of the housing, reduces the temperature of the flue gases. Means

within the housing gas passageway direct the flue gases toward burner means which initiate combustion of the unburned hydrocarbons in the flue gases while additional



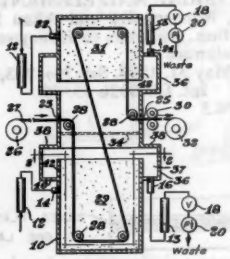
air, supplied by the heat exchanger means, supplements the oxygen content of the flue gases as they progress through the burner means to maintain combustion.

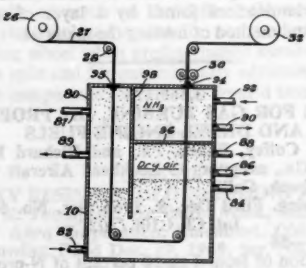
3,560,166

SYSTEM FOR TREATMENT OF SUBSTRATES BY A PLURALITY OF FLUID REACTANTS

Wilhelm E. Walles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

Filed Feb. 5, 1968, Ser. No. 703,085
Int. Cl. B01j *1/00*
U.S. Cl. 23—285 **16 Claims**





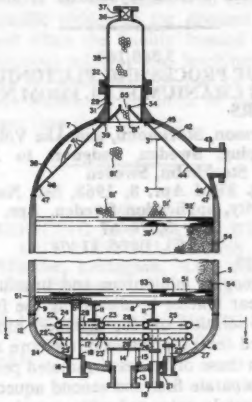
A system and apparatus for effecting the continuous chemical treatment of substrates by layers of two chemical reactants having different densities, one lighter than air and one heavier than air is described. The substrates are led into a vertical container having two sections, one section having one reactant, then into a layer of air separating the reactants and then into the second section having the other reactant. The layers of reactants are established by vertical walls of a predetermined height and excess reactants are removed by means of interior or exterior channels in the system.

3,560,167

UPFLOW CATALYTIC REACTOR FOR FLUID HYDROCARBONS

Charles J. Bruckner, Drexel Hill, and Edward A. White, Middletown Township, Pa., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa., a corporation of Delaware

Filed Dec. 18, 1968, Ser. No. 784,712
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 **10 Claims**



A reactor for contacting hot, liquid-phase or mixed-phase hydrocarbons with a compact mass of granular catalyst maintained within the reactor as a fixed bed; in which reactor, the liquid hydrocarbons, with or without accompanying gaseous reactants, are caused to flow upwardly through the bed, in a flooded operation, at such relatively-high rate of flow as to cause possible mass lifting and falling of the bed or such volumetric expansion thereof as to create an internal disturbance of the catalyst particles resulting in detrimental attrition of the catalyst. The reactor is provided at its upper end and spaced therefrom with a perforated frusto-conical means to contain the upper portion of the bed. Means are provided for automatically adding inert material to the top of the bed through the frusto-conical means from a reservoir mounted on top of the reactor vessel.

3,560,168

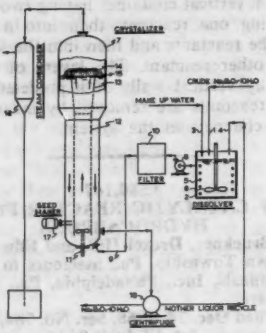
SINGLE CRYSTAL SODIUM TETRABORATE DECAHYDRATE PRODUCTION

Lyman S. Stanton, Martinez, and James V. Wiseman, Lafayette, Calif., assignors to Stauffer Chemical Company, New York, N.Y., a corporation of Delaware

Continuation of application Ser. No. 565,288, July 14, 1966. This application Sept. 2, 1969, Ser. No. 856,892
Int. Cl. B01d *7/02*; C01b *15/12*
U.S. Cl. 23—302 **1 Claim**

Process for producing single crystal borax by supersaturating an aqueous solution of borax containing slur-

ried seed crystals to a low concentration and then allowing the supersaturated solution to return to normal satura-



tion. Improved apparatus for generating seed crystals in a vertical vacuum cooling crystallizer is also described.

3,560,169

MANNER OF PROCESSING PLUTONIUM-CONTAINING URANIUM FUEL FROM NUCLEAR REACTORS

Alf Harald Larsson, Stockholm, and Åke Valdemar Hultgren, Nykoping, Sweden, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

No Drawing. Filed Apr. 8, 1968, Ser. No. 719,736
Claims priority, application Sweden, Apr. 21, 1967, 5,676/67
Int. Cl. B01d *11/04*
U.S. Cl. 23—339 **3 Claims**

In the recovery of plutonium and uranium from the core of a nuclear reactor by dissolving the fuel elements in an aqueous solution of, for instance, nitric acid, the highly irradiated central portions of the core are dissolved separately from those of the less irradiated peripheral portions to form separate first and second aqueous solutions which are separately extracted with organic solvents, the first solution with one selective to plutonium relative to uranium and fission products and the second one selective to plutonium and uranium relative to fission products. The residue of the first solution is combined with the second solution.

3,560,170

ROD-SHAPED MULTILAYER SEMIFINISHED MATERIAL AND A PROCESS AND AN APPARATUS FOR MANUFACTURING SUCH MATERIAL

Eugen Dürrwächter, Carl-Ludwig Meyer, Ulf Harmsen, and Wolfgang Pöttken, Pforzheim, Germany, assignors to Dr. Eugen Durrwachter DODUCO, Pforzheim, Germany

Original application May 3, 1966, Ser. No. 547,282. Divided and this application July 17, 1968, Ser. No. 767,868
Claims priority, application Germany, Jan. 3, 1966, D 49,065, D 49.066, D 49,067
Int. Cl. B22f *7/02*
U.S. Cl. 29—182.2 **10 Claims**

An item formed by extrusion from a plurality of sinter-bonded layers is used as an electrical contact piece subject to mechanical wear. The particular structure of the piece including an as-extruded fibrous structure and a plurality of sinter-bonded layers, one of which is formed from a solderable material, and the other of which comprises a metal and another component formed by the thermal decomposition of a material which evolves gas when subject to heat is also claimed.

3,560,171

THERMOSTAT METAL

Jacob L. Ornstein, Norton, Ernest R. Howard, Attleboro, and Seth R. Thomas, Plainville, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex., a corporation of Delaware

Filed May 1, 1968, Ser. No. 725,724
Int. Cl. B32b *15/00*
U.S. Cl. 29—195.5 **6 Claims**

A three-layer, composite thermostat material of high flexivity and electrical resistivity and low cost is shown to comprise a layer of metal of relatively high coefficient of thermal expansion embodying a chromium-nickel-iron alloy and a layer of metal of relatively low coefficient of thermal expansion embodying a nickel-iron alloy, these metal layers being metallcrgically bonded to opposite sides of an intermediate metal layer of stainless steel. The resistivity, corrosion resistance, strength, work-hardening properties, and ability to withstand high temperatures of the intermediate metal layer cooperate with the corresponding characteristics of the high and low expansion materials bonded thereto to provide an economical, composite thermostat material having a resistivity, flexivity, corrosion resistance, useful deflection temperature range, strength, and ability to withstand high temperatures comparable to composite thermostat materials previously achieved only at substantially greater cost.

3,560,172

IRON-SILICON MAGNETOSTRICTIVE LAMINATED MATERIAL AND ELEMENTS

John R. Kench, Minneapolis, and Allan Pierskalla, St. Louis Park, Minn., assignors to Honeywell Inc., a corporation of Delaware

Filed May 31, 1968, Ser. No. 733,650
Int. Cl. B32b *15/00*
U.S. Cl. 29—196.3 **6 Claims**

A laminated magnetostrictive material consisting of silicon-iron laminations joined by a layer of a copper-silver alloy and method of making the material.

3,560,173

ADDITIVE FOR GAS TURBINE, JET PROPULSION AND DIESEL ENGINE FUELS

Richard C. Coffey, Baden, Pa., and Richard L. Smith, Atlanta, Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

No Drawing. Filed Dec. 9, 1966, Ser. No. 600,392
Int. Cl. C10l *1/02*
U.S. Cl. 44—56 **4 Claims**

The addition of from 1 to 10 percent of N-propyl alcohol to aviation fuels prevents the separation from the fuel of both the dissolved and the suspended water. Gas turbine, jet propulsion, and like fuels normally contain 15

to 30 parts per million of suspended water and approximately 75 parts per million dissolved water. In-flight cooling and vibration causes the coalescence of this water and it accumulates in the bottom of the tank where it promotes the growth of microorganisms and the corrosion of aircraft structure. The addition of the N-propyl alcohol to the fuel prevents the separation of this water from the fuel and the consequent damage to the aircraft structure.

3,560,174
MOTOR FUEL COMPOSITION

Stanley R. Newman, Fishkill, Kenneth L. Dille, Wappingers Falls, and Rodney L. Sung, Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

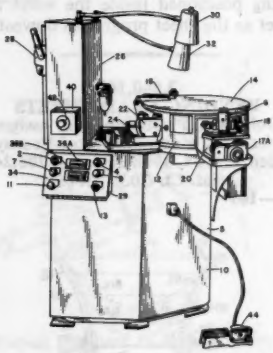
No Drawing. Filed Nov. 22, 1967, Ser. No. 684,971
Int. Cl. C01l *1/26*
U.S. Cl. 44—69 **4 Claims**

Motor fuel composition containing 2-chloroethyl diphenyl phosphate surface ignition suppressor.

3,560,175
DRILL SPLITTING APPARATUS

John E. Buchanan, Arlington, Tex., assignor to Precision Drill Pointing Incorporated, Arlington, Tex., a corporation of Texas

Filed Aug. 5, 1968, Ser. No. 750,210
Int. Cl. B24b *19/00*
U.S. Cl. 51—96 **15 Claims**



There is disclosed a drill splitting apparatus having a plurality of work stations. The apparatus includes means for positioning the drill adjacent to the grinding wheel to grind a split or notch on the drill at the desired angle. There is also disclosed means for automatically dressing the grinding wheel when predetermined numbers of drills have been split and for automatically advancing the work stations to compensate for material dressed from the grinding wheel.

3,560,176
EPOXY RESIN BONDED GRINDING WHEEL

John R. Thompson, Westboro, Mass., assignor to Avco Corporation, Cincinnati, Ohio

No Drawing. Filed Dec. 19, 1968, Ser. No. 785,400
Int. Cl. C08g *51/12*
U.S. Cl. 51—298 **13 Claims**

The invention is directed to an organic resin bond for abrasive. An epoxy resin system containing grinding aid substituents in the molecular structure is described and claimed with halogenated bisphenol-based resins preferred.

3,560,177
MANUFACTURE OF GLASS FIBERS

Stéphane de Lajarte, Paris, and Jean Asolo, Les Clayes-sous-Bois, Yvelines, France, assignors to Compagnie de Saint-Gobain, Victor-Hugo, Neuilly-sur-Seine, Seine, France, a corporation of France

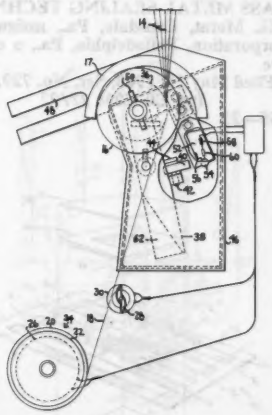
Continuation-in-part of application Ser. No. 563,635, July 1, 1966, which is a continuation-in-part of application Ser. No. 208,280, July 9, 1962. This application Apr. 3, 1968, Ser. No. 724,675
Claims priority, application France, Dec. 27, 1961, 883,117
Int. Cl. C03c *25/06*
U.S. Cl. 65—3 **8 Claims**

The continuous production of a mat of glass fibers having high temperature-resistant characteristics is made possible by the formation of the mat from freshly made fibers, exceeding one micron in diameter, of a glass composition having a predetermined content of silica and alkali oxide, ranging from 66% to 73% of the former, and 34% to 27% of the latter, with less than 5% of stabilizing metallic oxides of the divalent and trivalent groups, so that when the freshly formed mat is passed through an aqueous mineral acid leaching bath immediately following its formation, the mat of fibers is transformed to one essentially of silica in the course of a period no longer than three minutes.

3,560,178
FIBER PRODUCING APPARATUS WITH BREAK OUT CONTROL MEANS

Jackson D. Minkler, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa., a corporation of Pennsylvania

Filed July 9, 1968, Ser. No. 743,559
Int. Cl. C03b *37/02*
U.S. Cl. 65—11 **4 Claims**



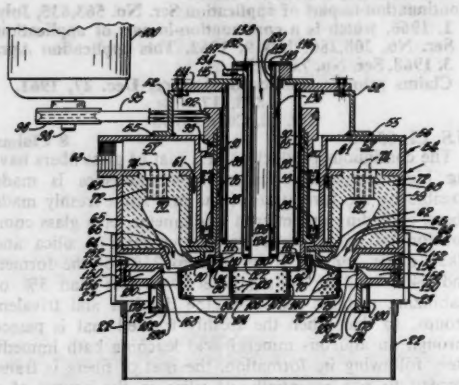
A resilient element in a mercury switch is attracted by a magnet attached to a weighted arm of a pivoted gathering shoe which groups filaments into a strand to complete the electrical circuit for the winder motors and traverse. Upon break-out of the strand, the shoe pivots, the mercury switch is opened and the winder and traverse motors are electrically disconected and stop operating.

3,560,179

ROTARY APPARATUS WITH FLUID BLAST MEANS FOR MAKING GLASS FIBERS FROM HEAT-SOFTENABLE MINERAL MATERIALS

Dale Kleist, St. Louisville, Ohio, assignor to Owens-Corning Fiberglas Corporation, a corporation of Delaware

Filed July 9, 1968, Ser. No. 743,545
Int. Cl. C03b *37/04, 37/06*
U.S. Cl. 65—14 4 Claims



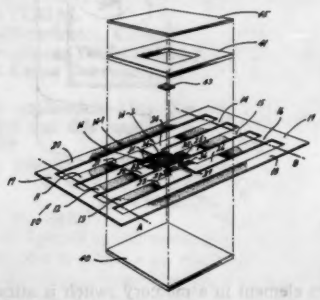
The disclosure embraces a method of and apparatus for processing heat-softenable mineral materials, such as glass, and involves delivering primary filaments by centrifugal forces from a spinner into a gaseous blast which attenuates the primary filaments into fibers. The apparatus includes a blower control surface fashioned with a recess or zone configurated to establish turbulence at a region to promote fracture of longer fibers into shorter length fibers, the latter being particularly useful in forming high density fibrous products.

3,560,180

GLASS METAL SEALING TECHNIQUE

Kathleen G. Merat, Lansdale, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa., a corporation of Delaware

Filed May 15, 1968, Ser. No. 729,260
Int. Cl. C03c *27/02*
U.S. Cl. 65—23 2 Claims



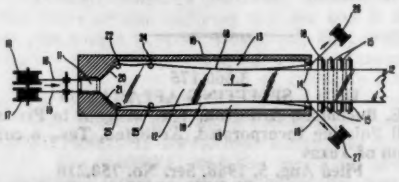
A method of glass sealing metallic portions of a lead frame to produce a microcircuit flat pack wherein magnesia is applied to surface areas of the lead frame, the surface areas laying inside and outside of the metallic portions. A glass seal ring is superimposed over the metallic portions and is then sealed to those portions. The magnesia prevents the glass from wetting the surface areas to which the magnesia was applied. Thereafter, the magnesia is removed.

3,560,181

METHOD AND APPARATUS FOR CONTROLLING THE WIDTH AND THICKNESS OF FLOAT GLASS

Stéphane Dufaure de Lajarte and Maurice Bourgeaux, Paris, France, assignors to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France

Filed Nov. 28, 1967, Ser. No. 686,227
Claims priority, application France, Dec. 8, 1966, 86,656
The portion of the term of the patent subsequent to Sept. 23, 1986, has been disclaimed
Int. Cl. C03b *18/00*
U.S. Cl. 65—91 6 Claims



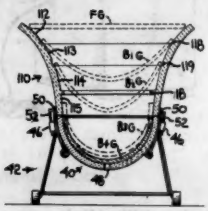
A method and apparatus for preventing the thickening and shrinking of glass sheet which employs flexible wire spreaders which travel within the edges of the glass and heated mechanical guides which sustain the efforts of the wires by being positioned inside the wires and through the glass sheet as the sheet progresses downstream.

3,560,182

BENDING GLASS SHEETS

James S. Golightly, Pittsburgh, Pa., assignor to PPG Industries, Inc., a corporation of Pennsylvania

Filed Jan. 24, 1968, Ser. No. 700,242
Int. Cl. C03b *23/00*
U.S. Cl. 65—107 9 Claims



Method and apparatus for bending glass sheets by gravity sagging using a slide containing one or more discontinuities, such as grooves and/or ridges, extending circumferentially of the slide in spaced horizontal planes to interrupt free sliding of the sheet down the slide intermittently to interrupt any tilting of the glass sheet relative to the shaping surface of the bending apparatus.

3,560,183

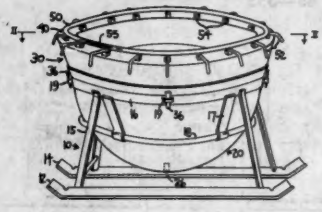
BENDING GLASS SHEETS

George W. Stilley, Freeport, and John A. Comperatore, Natrona Heights, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa., a corporation of Pennsylvania

Filed Sept. 13, 1968, Ser. No. 759,602
Int. Cl. C03b *23/02*
U.S. Cl. 65—107 3 Claims

Bending thick glass into hemispherical shapes comprising using a mold of concave elevation of material having

less thermal expansivity than glass, said mold comprising a ring of rigid material having greater thermal expansivity than glass and sufficiently smaller in diameter than the mold at glass loading temperature to support the glass

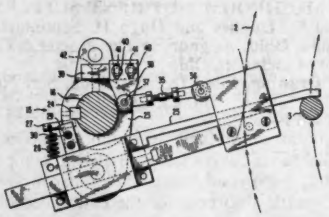


over said mold at the temperature at which the mold is loaded and capable of expanding sufficiently more rapidly than the mold to deposit the glass onto the mold after the glass has attained a sufficiently high temperature to deform in response to external stresses.

3,560,184
APPARATUS FOR GAUGING THE POSITION OF A GLASS TUBE

William E. Hughes and Charles A. Porter, Vineland, N.J., assignors to Owens-Illinois, Inc., a corporation of Ohio

Continuation of application Ser. No. 508,454, Nov. 18, 1965. This application May 14, 1969, Ser. No. 826,082
Int. Cl. C03b *23/12*
U.S. Cl. 65—158 **8 Claims**



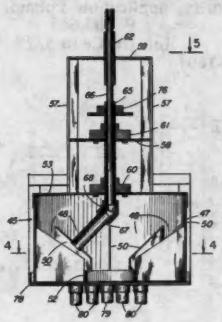
This application discloses an apparatus for gauging the length of a glass article which is useful in an ampule forming machine. The gauging plate is mounted in a manner which permits it to travel through substantially the same arcuate path as the tubing during the brief interval of receiving such tubing even though the gauging plate is pivotally mounted about an axis located radially outwardly from the tubing path of travel. The movement of the gauging plate through substantially the same path as the tubing for this brief interval reduces relative movement between the tubing and the gauging plate which occurs in conventional ampule machines, and which causes deformation to the tubing.

3,560,185
APPARATUS FOR FEEDING VITREOUS MATERIAL

Arthur G. Nylander, Passaic, N.J., assignor to Potter Bros. Inc., Carlstadt, N.J., a corporation of New York

Filed Mar. 11, 1968, Ser. No. 712,293
Int. Cl. C03b *19/10*
U.S. Cl. 65—142 **13 Claims**

An apparatus for evenly distributing crushed glass particles among a plurality of flow paths leading to the draft tube of a bead furnace. The particles are directed through a single feed conduit having a laterally extending portion which is positioned above a receptacle containing an annular array of bins. These bins are respectively

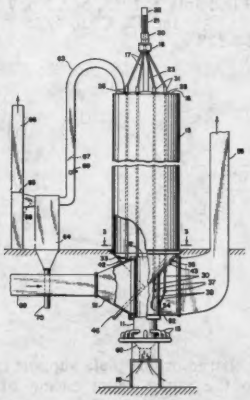


connected to the infeed ends of the flow paths. The feed conduit is continuously rotated at a uniform rate to successively position the laterally extending portion over each of the bins and thereby evenly distribute the particles among the flow paths.

3,560,186
APPARATUS FOR PRODUCING GLASS BEADS WITH PREHEATING MEANS

Arthur G. Nylander, Passaic, N.J., assignor to Potters Bros., Inc., Carlstadt, N.J., a corporation of New York

Filed Mar. 11, 1968, Ser. No. 712,186
Int. Cl. C03b *19/10*
U.S. Cl. 65—142 **12 Claims**

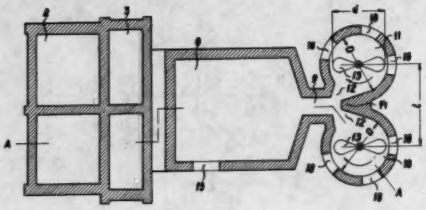


An apparatus for producing glass beads from crushed glass particles in which the infeed conduits for the particles extend for an appreciable length within the vertical expansion chamber of the bead furnace, thus preheating the particles prior to the time they are introduced into the draft tube of the furnace.

3,560,187
TANK FURNACE FOR CONTINUOUS PRODUCTION OF CRYSTAL GLASS

Mieczyslaw Hryszkiewicz and Michal Tokarski, both of Ul. Hutnicza 3, Stronie Slaskie, Poland; Jan Wojcicki, Ul. Orwicza 6, Krakow, Poland; and Zbigniew Uljasz, Ul. 22go Lipcol 41, Sosnowiec, Poland

Continuation of application Ser. No. 487,354, Sept. 3, 1965. This application Jan. 13, 1969, Ser. No. 793,229
Claims priority, application Poland, Sept. 7, 1964, P 105,661
Int. Cl. C03b *5/18*
U.S. Cl. 65—180 7 Claims



Apparatus for the continuous treatment of molten glass having a melting tank which opens via a narrow passageway at the bottom of the tank into a pair of cylindrical mixing chambers containing stirrers, the chambers being connected in parallel at the narrow passageway.

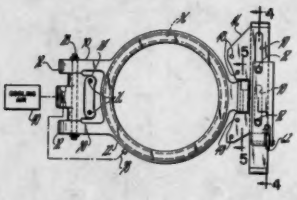
ERRATUM

For Class 65—260 see:
Patent No. 3,559,425

3,560,188
GLASS FEEDING APPARATUS HAVING A PLURAL CHARGE ORIFICE PLATE SUPPORT FRAME

Frederick W. Winzer, East Granby, Conn., assignor to Emhart Corporation, Bloomfield, Conn., a corporation of Connecticut

Filed July 3, 1968, Ser. No. 742,346
Int. Cl. C03b *5/26*
U.S. Cl. 65—328 4 Claims

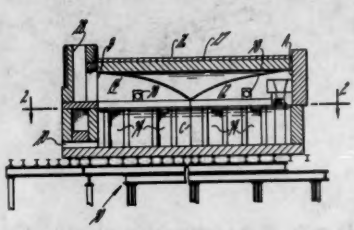


A plural charge orifice plate support frame is pivotally mounted to the outlet spout casing of a molten glass feeder bowl, and a sliding latch, also mounted to the casing, clamps a free end of the frame in its raised position so that an internally cooled plural charge orifice plate is positioned adjacent the outlet spout. The frame includes an annular portion which is hollow and carries cooling air to the orifice plate. The sliding latch includes a slide movable across the path of pivotal movement of the free end of the frame, the free end and the slide having cooperating ramp surfaces for camming the free end into a latch opening.

3,560,189
GLASS MAKING FURNACE

John F. Blumenfeld, Simsbury, and George F. Hanks, Avon, Conn., assignors to Emhart Corporation, Bloomfield, Conn., a corporation of Connecticut

Filed Feb. 27, 1968, Ser. No. 708,687
Int. Cl. C03b *3/00*
U.S. Cl. 65—335 3 Claims



A square shaped furnace has dual glass batch chargers at one corner, and a throat through which the molten glass can be withdrawn at a diagonally opposite corner. The furnace has roof with a maximum height along a line connecting thhe diagonally opposed corners, and the height decreases toward the other two laterally opposed corners of the square furnace. The molten glass is heated from above by burners, and laterally opposed electrodes mounted in bays in the furnace side walls extend into the molten glass for Joule-effect heating.

3,560,190
MUSHROOM NUTRIENT SUPPLEMENT

Donald H. Hughes and Hugo H. Schumacher, Jr., Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Dec. 30, 1968, Ser. No. 788,080
Int. Cl. C05f *11/00*
U.S. Cl. 71—5 7 Claims

A pre-mixed, dry, friable, granular, nutrient supplement for mushroom cultivation is disclosed, comprising cottonseed oil, cottonseed meal, and a hardwood sawdust or fuller's earth absorbent for the cottonseed oil.

3,560,191
NORMALLY LIQUID MIXTURES OF ELEMENTAL PHOSPHORUS AND SULFUR AS PLANT NUTRIENTS

Gustave K. Kohn, Berkeley, and Robert E. Warnock, Concord, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Nov. 22, 1968, Ser. No. 778,311
Int. Cl. C05b *17/00*
U.S. Cl. 71—32 5 Claims

Soil is fertilized with sulfur and phosphorus by applying normally liquid mixtures of elemental white phosphorus and elemental sulfur at a depth of about 1 to 10 inches and at a rate of about 5 to 120 pounds per acre.

3,560,192
MICRONUTRIENT ENRICHED GRANULAR FERTILIZERS

George Di Cicco, Lawrenceville County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 3, 1968, Ser. No. 726,580
Int. Cl. C05b *7/00*
U.S. Cl. 71—51 8 Claims

Free-flowing and uniform micronutrient enriched fertilizer compositions are provided. The compositions include a granular fertilizer, up to about 20% by weight of a finely divided micronutrient, and an aqueous zinc chloride

binder solution. The zinc chloride binder is present in an amount sufficient to bind the micronutrient to the surface of the fertilizer granules without destroying the fertilizer's free-flowing properties. The compositions are prepared by first moistening the surfaces of the fertilizer granules with the binder and then mixing the micronutrient with the moistened granules until adhesion is substantially complete.

3,560,193

ARSONATE HERBICIDE COMPOSITIONS

John H. Kirch, Roslyn, Pa., assignor to Amchen Products, Inc., Ambler, Pa.

No Drawing. Continuation-in-part of applications Ser. No. 597,204, Nov. 28, 1966, and Ser. No. 718,251, Apr. 2, 1968. This application Aug. 25, 1969, Ser. No. 852,897

The portion of the term of the patent subsequent to Sept. 9, 1986, has been disclaimed

Int. Cl. A01n *9/20*

U.S. Cl. 71—97 **5 Claims**

A herbicidal composition and method of use for eradicating perennial woody and brush species involving a composition including an arsonate compound and a phenoxyalkanoic compound.

3,560,194

FERTILIZER

Ira B. Phillips, Tucson, and Ben E. Adams and William H. Lawhon, Carlsbad, N. Mex., assignors to Duval Corporation, Houston, Tex.

No Drawing. Filed Aug. 24, 1966, Ser. No. 574,806

Int. Cl. C05d *1/02*

U.S. Cl. 71—64 **4 Claims**

This patent discloses the treatment of fertilizer salts with mineral oil to reduce dusting.

3,560,195

N - ALKOXY - 2 - BENZIMIDAZOLE CARBOXIMIDOYL CHLORIDES

George Holan, Brighton, Victoria, and Eva Lea Samuel, Bentleigh, Victoria, Australia, assignors to Monsanto Chemical (Australia) Limited, West Footscray, Victoria, Australia

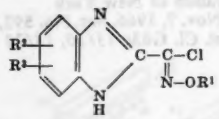
No Drawing. Filed Sept. 18, 1967, Ser. No. 668,679

Claims priority, application Australia, Sept. 19, 1966, 11,199/66

Int. Cl. A01n *9/22*

U.S. Cl. 71—92 **5 Claims**

N-alkoxy-2-benzimidazole carboximidoyl chlorides of the formula:



wherein R^1 is alkyl of not more than six carbon atoms; R^2 and R^3 are independently selected from the group consisting of hydrogen, chlorine, bromine, nitro, alkyl of not more than four carbon atoms and alkoxy of not more than four carbon atoms, exhibit herbicidal activity.

3,560,196

BIOLOGICALLY ACTIVE PARTICULATE MATERIAL AND THE PROCESS FOR MANUFACTURING SAME

John C. Horai, Hagerstown, and Stephen F. Tucker, Clear Spring, Md., assignors to The Ruberoid Co., New York, N.Y., a corporation of New Jersey

No Drawing. Filed Apr. 26, 1967, Ser. No. 633,718

Int. Cl. A01n *9/24*

U.S. Cl. 71—115 **4 Claims**

Biologically active particulate material capable of releasing a biochemical at a controlled rate due to the change of environmental conditions, is manufactured by coating granules in the range of 10 to 50 mesh with a biochemical and a silicate binder and thereafter partially insolubilizing the binder.

3,560,197

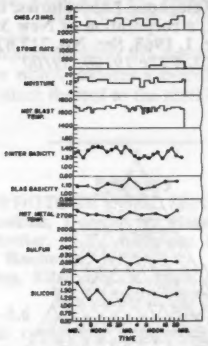
METHOD OF BLAST FURNACE CONTROL

Donald J. Shellenberger, Bethel Park, and Thomas A. Powell, Jr., Upper St. Clair, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Mar. 20, 1968, Ser. No. 714,738

Int. Cl. C21b *5/00*

U.S. Cl. 75—41 **4 Claims**



The operation of a blast furnace is controlled by changing the moisture level of the hot blast in response to variations in the peak hot metal temperature from cast to cast with relation to an aim peak hot metal temperature. Burden ratio changes are made as the hot blast moisture level reaches predetermined maximum and minimum values along with equivalent moisture changes in order to maintain the moisture level within a predetermined range without affecting the hot metal temperature.

3,560,198

SEPARATION OF MAGNESIUM AND CARBON MONOXIDE VAPORS

William A. Mod, John J. Newport III, and Oliver Osborn, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 14, 1967. Ser. No. 660,215

Int. Cl. C22b *45/00, 9/08*

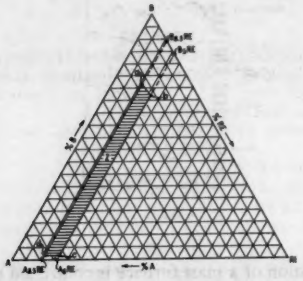
U.S. Cl. 75—67 **6 Claims**

A process for separating magnesium vapors from carbon monoxide vapors which comprises: contacting a magnesium-carbon monoxide vapor mixture maintained at a temperature of from about 1500° to about 1850° C. with a purification bed consisting of metal carbides which are characterized in that they react with carbon monoxide to form metal oxides and carbon at the indicated temperature range and furthermore, the metal carbides and metal oxides are not reduced by the magnesium vapors and do not fuse, melt or volatilize at the indicated temperature range. The metal carbides are further characterized in that they can be regenerated by heating the resultant metal oxides and carbon to a temperature greater than the separation temperature.

3,560,199
PROCESS FOR CHLORINATION OF MATERIAL CONTAINING HARD METAL
Kurt Alfred Jönsson, Nynashamn, Sweden, assignor to Rederiaktiebolaget Nordstjernan, Nynashamn, Sweden
No Drawing. Filed Feb. 29, 1968, Ser. No. 709,230
Claims priority, application Sweden, Mar. 14, 1967, 3,500/67
Int. Cl. C22b *7/00*
U.S. Cl. 75—112 6 Claims

The invention relates to the chlorination of hard metal scrap i.e., cemented carbide. In order to gasify the carbon from the carbides of the hard metal carbon dioxide is added in the chlorination process.

3,560,200
PERMANENT MAGNETIC MATERIALS
Ethan A. Nesbitt, Berkeley Heights, Jack H. Wernick, Madison, and Ronald H. Willens, Martinsville, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York
Filed Apr. 1, 1968, Ser. No. 717,671
Int. Cl. C22c *19/00, 39/00*
U.S. Cl. 75—122 17 Claims



The specification describes magnetic compositions of the ternary system Co-Cu-Rare earth and related compositions wherein the cobalt may be partially or completely substituted with iron, aluminum or nickel. Certain of the included compositions have coercivities of many thousands of oersteds.

3,560,201
METHOD OF PRECIPITATING METAL VALUES
Clarence Arthur Lefler, Kearny, Ariz., and Gerald D. Mittelstadt, Republic, Mich., assignors to Kennecott Copper Corporation, New York, N.Y., a corporation of New York
Original application July 11, 1966, Ser. No. 564,112, now Patent No. 3,479,020, dated Nov. 18, 1969. Divided and this application Feb. 13, 1969, Ser. No. 810,439
Int. Cl. C22b *15/12*
U.S. Cl. 75—109 6 Claims

A column of solid precipitant is maintained within a reaction zone and a solution pregnant with values to be recovered is injected into the column at the lower end of the reaction zone. Periodically and while pregnant solution continues to be injected, a quantity of solution is discharged from the lower end of the reaction zone to flush out accumulated precipitate and to flush precipitate from precipitant in the lower part of the column. Precipitate is preferably also collected immediately below the column of precipitant, and the periodic discharges of solution are sudden and massive for flushing purposes.

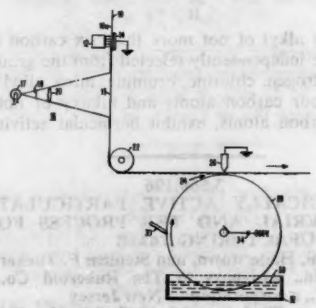
3,560,202
STRAIN METER FUNCTIONING ALLOY
Haruo Kawamoto, 4–1904 Kamitakaido, Suginami-ku, Tokyo, Japan
Filed Apr. 19, 1968, Ser. No. 722,677
Claims priority, application Japan, Apr. 26, 1967, 42/26,275
Int. Cl. C22c *27/00*
U.S. Cl. 75—176 1 Claim

A strain meter functioning alloy of chromium base having specific characteristics towards temperature and sensitivity. These characteristics are provided by the addition of appropriate quantities of Al and Fe to the alloy. The addition of these elements renders the strain meter functioning alloy to have such characteristics that it has larger gauge factor and that temperature coefficient of gauge factor and temperature coefficient of electric resistance can be controlled negative or positive in the neighbourhood of zero point. By virtue of these characteristics, the strain meter equipped with the allow of this invention will be provided with such features that it has the least displacement of zero point and little sensitivity change by temperature variation.

3,560,203
ELECTROPHOTOGRAPHIC DEVELOPING PROCESS
Satoru Honjo and Masamichi Sato, Kita-Adachigun, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 2, 1967, Ser. No. 680,227
Claims priority, application Japan, Nov. 2, 1966, 41/72,265
Int. Cl. G03g *13/00*
U.S. Cl. 96—1 7 Claims

In an electrophotographic liquid developing process wherein a reversal development is carried out while applying an external voltage, the improvement comprising varying said external voltage so as to be synchronized with the attenuation characteristics of a light sensitive layer in contact with the liquid developing solution, and thereby applying a voltage sufficient to just negative an electric field by electric charges of a maximum charge density or a voltage slightly less than that.

3,560,204
PRINTING BY ELECTRICAL ATTRACTION OF INKS
Eugene P. Damm, Jr., Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk N.Y., a corporation of New York
Filed Nov. 7, 1966, Ser. No. 592,547
Int. Cl. G03g *13/10, 13/22*
U.S. Cl. 96—1 11 Claims



Printing is effected by first placing an electric charge over the coated surface of a zinc oxide coated web of

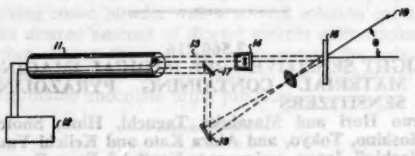
paper. This charge is neutralized in selected image areas by a projected light image. The web is then passed between a ground electrode and a smooth ink bearing conductive drum charged to a potential on the order of that of the unneutralized portions. Liquid ink from the drum is bodily attracted from the drum to the neutralized image areas in an unsupported column.

3,560,205

METHOD OF FORMING A PHASE MODULATING HOLOGRAM ON A DEFORMABLE THERMOPLASTIC

John C. Urbach, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y., a corporation of New York

Filed Jan. 20, 1966, Ser. No. 521,982
Int. Cl. G03g *13/22*
U.S. Cl. 96—1.1 **10 Claims**



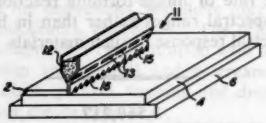
Method and apparatus for producing holographic interference patterns wherein a modulated coherent object beam and an off axis reference beam cooperate to discharge a photoconductive thermoplastic recording member which is then recharged and allowed to deform in accordance with the residual charge pattern thereon. The off axis angle is a function of the quasi-resonant frequency of the thermoplastic.

3,560,206

PRODUCTION OF LATENT PERIODIC MEMORY PATTERNS IN FROSTABLE FILMS

Alex E. Jvirblis, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y., a corporation of New York

Filed Dec. 21, 1966, Ser. No. 603,545
Int. Cl. B41m *5/18*
U.S. Cl. 96—1.1 **7 Claims**



Prescreening techniques are set forth which produce latent periodic memory patterns in the deformable surface of a frostable recording member. When the pretreated material is later used in a conventional frost imaging mode it is found that the prescreened latent pattern develops on the frostable surface and undergoes amplification under the influence of the development environment, finally serving as the modulated carrier for the frost imagery impressed thereupon.

3,560,207

CYANINE DYES CONTAINING A PYRAZOLE NUCLEUS AS SPECTRAL SENSITIZERS FOR ORGANIC PHOTOCONDUCTORS

Earl J. Van Lare, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Jan. 31, 1968, Ser. No. 701,828
Int. Cl. G03g *5/00, 5/06*
U.S. Cl. 96—1.6 **34 Claims**

Organic photoconductors are spectrally sensitized with cyanine dyes containing a pyrazole nucleus.

3,560,208

CYANINE DYE CONTAINING A PYRROLE NUCLEUS USED AS A SENSITIZER FOR ORGANIC PHOTOCONDUCTORS

Arthur Fumia, Jr., and Donald W. Heseltine, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Feb. 15, 1968, Ser. No. 705,619
Int. Cl. G03g *51/06*
U.S. Cl. 96—1.6 **30 Claims**

Organic photoconductors are spectrally sensitized with a cyanine dye which features a pyrrole nucleus linked by the 2-carbon atom thereof to the methine chain of the dye.

3,560,209

ELECTROPHOTOGRAPHIC SENSITIZING DYES

Philip W. Jenkins, Donald W. Heseltine, and John D. Mee, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 9, 1968, Ser. No. 766,327
Int. Cl. G03g *5/06*
U.S. Cl. 96—1.6 **46 Claims**

Compounds containing a heterocyclic nitrogen atom substituted by an —OR group are useful as sensitizers for photoconductors in electrophotographic elements.

3,560,210

METHOD OF RECORDING A PLURALITY OF HOLOGRAMS AND SEPARABLE EMULSION EXPOSURE PACKAGE THEREFOR

Allen W. Grobin, Jr., Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed Jan. 13, 1967, Ser. No. 609,203
Int. Cl. G03c *5/04, 1/90*
U.S. Cl. 96—27 **2 Claims**

An emulsion exposure package is made of a photosensitive emulsion on a glass plate and a reflecting surface on a base cemented to the emulsion by an ice water soluble coating of a vinyl acetal resin. The base with reflecting surface is removed by dissolving the coating in water at a temperature on the order of 5° C. A plurality of layers of emulsion may also be cemented together by a soluble coating, and may be mounted on or between glass plates. Several holograms may be recorded in the emulsions.

3,560,211

LIGHT SENSITIVE LEUCO DYE SYSTEMS CONTAINING NO MOLECULAR OXYGEN THEREIN

Richard A. Fotland, Lyndhurst, Ohio, assignor to Horizons Incorporated, a division of Horizons Research Incorporated

No Drawing. Filed Sept. 22, 1967, Ser. No. 669,678
Int. Cl. G03c *1/72, 5/24*
U.S. Cl. 96—48 **14 Claims**

Compositions consisting essentially of a mixture of (1) at least one leuco dye base and (2) an organic or inorganic iodide, chloride or bromide, preferably dispersed

or dissolved in a synthetic polymer, e.g. as a film, exhibit sensitivity to high energy radiation, i.e., radiation having wavelengths shorter than 400 millimicrons.

Subjecting the composition (film) to an oxygen free atmosphere preferably under conditions such that molecular oxygen present in the composition is removed from the composition is found to markedly increase the sensitivity of the same, when the treatment is effected prior to or during exposure to the high energy radiation.

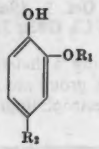
3,560,212

PROCESSING OF COLOUR PHOTOGRAPHIC MATERIALS IN THE PRESENCE OF A COMPETING COUPLER

Eric MacDonald, Holcombe Brook, England, Billie Nam, Lexington, Mass., and David Price, Chelmsford, England, assignors to Ilford Limited, Ilford, England

No Drawing. Filed Oct. 23, 1967, Ser. No. 677,059
Claims priority, application Great Britain, Oct. 28, 1966, 48,492/66
Int. Cl. G03c *7/02*
U.S. Cl. 96—55 7 Claims

This application describes a process of colour-development of colour photographic material wherein at least one silver halide emulsion layer containing a developable silver salt is colour developed to yield a dye image, the developed silver and the residual silver halide being removed, there is provided the step of developing the photographic material with a colour developing solution which contains alkali metal sulphite in the presence of an image-forming colour coupler and a compound of the following general formula:



where R_1 is an alkyl group containing up to 6 carbon atoms and R_2 is hydrogen or an easily displaceable substituent group.

3,560,213

DIRECT-POSITIVE SILVER HALIDE EMULSIONS CONTAINING SILVER HALIDE REDUCING AGENTS IN A LOW pH ENVIRONMENT

Heman Dowd Hunt, Eatontown, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Sept. 12, 1967, Ser. No. 667,077
Int. Cl. G03c *5/24*
U.S. Cl. 96—64 10 Claims

Direct-positive colloid-silver halide photographic emulsion layers containing a silver halide reducing agent in a low pH environment at all times prior to imagewise exposure.

3,560,214

DYE-CONTAINING PHOTOGRAPHIC ELEMENTS

Walter Robert Ruda, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware

Filed Mar. 7, 1968, Ser. No. 711,359
Int. Cl. G03c *1/84*
U.S. Cl. 96—84 10 Claims

Photographic elements are shown which contain light absorbing dyes characterized by carboxylic acid-substituted pyrazoline nuclei. Such dyes find utility as antihalation and filter dyes, the bleachability and nonmigratory characteristics of which may advantageously be altered by control of the pH of the dye environment.

3,560,215

LIGHT-SENSITIVE DIAZOTYPE MATERIAL

Carel Jacobus Knoester and Hubertus Johannes Wilhelmus Pecasse, Venlo, Netherlands, assignors to Van Der Grinten N.V., Venlo, Netherlands

No Drawing. Filed July 12, 1967, Ser. No. 652,694
Claims priority, application Netherlands, July 15, 1966, 6610037
Int. Cl. G03c *1/54, 5/34;* G07c *113/00*
U.S. Cl. 96—91 8 Claims

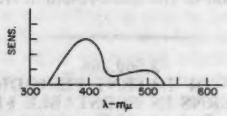
Diazotype material having improved light-sensitivity and developing speed with good keeping and exposure properties is provided by utilizing in the light-sensitive layer a para-(tertiary) amino-2-(fluoro, chloro or bromo)-3-(fluoro, chloro or bromo)-benzenediazonium compound in which one of the tertiary amino substituents is alkyl or aralkyl and the other is alkyl, aralkyl or cyclohexyl, or in which said substituents form a heterocyclic ring with the p-amino nitrogen atom. The compound gives especially good light-sensitivity and keeping qualities when the para-amino group is acyclic.

3,560,216

LIGHT SENSITIVE FREE RADICAL IMAGING MATERIAL CONTAINING PYRAZOLINE SENSITIZERS

Haruo Hori and Masahiko Taguchi, Hino, Shoichiro Hoshino, Tokyo, and Akira Kato and Keiichi Yumiki, Hachioji, Japan, assignors to Keuffel & Esser Company, Hoboken, N.J., a corporation of New Jersey

Filed Dec. 15, 1967, Ser. No. 690,898
Claims priority, application Japan, Dec. 16, 1966, 41/82,266
Int. Cl. G03c *1/72*
U.S. Cl. 96—90 1 Claim



Light-sensitive imaging materials comprising color modifiers which visibly change in color or shade in the presence of free radicals in combination with photoactivators which yield free radicals upon exposure to actinic light are substantially increased in light-sensitivity by the addition of an aryl-substituted pyrazoline compound. Such sensitizers are particularly effective in increasing the rate of image-forming reaction with respect to normal spectral ranges rather than in broadening the band of spectral response of such materials.

3,560,217

IRON OR COPPER COMPOUND CATALYTIC DECOMPOSITION OF THIOGLUCOSIDES IN RAPESEED

Clarence George Youngs, Henry R. Sallans, and John Milton Bell, Saskatoon, Saskatchewan, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

No Drawing. Filed Feb. 7, 1968, Ser. No. 703,562
Claims priority, application Canada, Feb. 21, 1967, 983,424
Int. Cl. A23k *1/00;* A23j *1/14*
U.S. Cl. 99—2 18 Claims

A process for the treatment of oil seeds of certain of the cruciferae family, such as rape and mustard to produce a proteinaceous product suitable for use in animal feedstuffs whereby in addition to the usual steps of crushing the seed, dry cooking the crushed seed to increase the

permeability of the cell walls thereof to oil, recovering oil from the crushed meal and drying the de-oiled meal, there is included the step of decomposing the thioglucosides by catalytic treatment with a compound of iron or copper at a temperature between from about 200° to 275° F. and at a moisture content of at least about 15%.

3,560,218

READILY DISPERSIBLE COCOA COMPOSITIONS CONTAINING DIOCTYL SODIUM SULFOSUCCINATE

Kenneth Whelan, Suffern, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 576,204, Aug. 31, 1966. This application Aug. 28, 1969, Ser. No. 853,982

Int. Cl. A23g *1/00*

U.S. Cl. 99—26 13 Claims

Readily dispersible cocoa compositions are provided containing from 0.05 to 0.75% by weight dioctyl sodium sulfosuccinate. The cocoa compositions can be prepared by mixing cocoa powder with a solvent solution containing the desired amount of dioctyl sodium sulfosuccinate, and then drying the mixture to evaporate the solvent. The cocoa compositions are useful in the preparation of reconstitutable chocolate drink products.

3,560,219

REMOVING LIPID MATERIAL FROM WHEY

Jerry M. Attebery, Minneapolis, Minn., assignor to Emery Carlton Swanson, Minneapolis, Minn.

No Drawing. Filed July 1, 1968, Ser. No. 741,270

Int. Cl. A23c *21/00*

U.S. Cl. 99—57 13 Claims

A process for removing dissolved lipid material from an aqueous solution, particularly from solutions containing protein and/or lactose, by adding a divalent metal ion and adjusting the pH to a value above 6 at a temperature below 140° F., producing a lipid-containing precipitate, and separating this precipitate from the supernate liquid.

3,560,220

DRIED EMULSIONS

James Gerow Bangert, 15 Pigeon Hill Road, Nanuet, N.Y. 10954, and Joseph John Halik, 1180 Midland Ave., Yonkers, N.Y. 10908

No Drawing. Filed Oct. 30, 1967, Ser. No. 679,178

Int. Cl. A23c *11/00*

U.S. Cl. 99—63 11 Claims

An edible composition comprising fat, emulsifier, water-soluble caseinate, whey, and a buffer is provided. The composition may be prepared by drying an aqueous emulsion containing the ingredients, and there may also be included gums, thickeners, flavors, etc. The dried products are especially adapted for reconstitution with aqueous liquids such as water and/or milk and/or cream to furnish a baking ingredient, garnish, topping and dressing, especially of the sour cream type.

3,560,221

SODIUM STEARYL FUMARATE IN CHEMICALLY LEAVENED BAKERY PRODUCTS

Carl P. Hetzel, Bellerose, and Philip F. Schamberger, Jr., East Northport, N.Y., assignors to Pfizer Inc.

No Drawing. Continuation-in-part of application Ser. No. 619,177, Feb. 28, 1967. This application Sept. 17, 1969, Ser. No. 858,848

Int. Cl. A21d *2/16, 13/08*

U.S. Cl. 99—92 4 Claims

Sodium stearyl fumarate in chemically leavened cake formulations prevents the adverse effects ordinarily encountered at increased sugar levels and reduced shortening levels.

3,560,222

METHOD OF RAPIDLY DEVELOPING AND STABILIZING THE CURED COLOR IN COMMINUTED MEAT AND COMPOSITION THEREFOR

William E. Delaney, Chicago, Ill., assignor to Kadison Laboratories, Inc., Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 500,231, Oct. 21, 1965. This application Sept. 4, 1969, Ser. No. 855,365

Int. Cl. A22c *11/00;* A23b *1/03*

U.S. Cl. 99—108 9 Claims

A composition, and method of using same, for effecting the rapid development and stabilization of the cured color in comminuted meat products which comprises a solid, substantially water-insoluble, heat-rupturable body of a size not appreciably greater than the particulate material of a comminuted meat mass or emulsion, said body consisting essentially of a substantially inert vehicle exemplified by ethyl cellulose and certain food grade acids exemplified by citric acid. The acid is insulated from the meat mass by the inert vehicle and is released into said mass upon rupture thereof by heat whereby a change in pH of the meat mass is brought about, and the rapid development and stabilization of the cured meat color is achieved. In one form of the composition, the acid insulating vehicle comprises an inert, water-soluble substance for initially entrapping the acid particles, and an inert, substantially water-insoluble, heat rupturable substance for insulating the entrapped particles from the meat mass.

3,560,223

LIVER SAUSAGE WITH CASING AND METHOD OF PREPARING SAME

Albin F. Turbak, Danville, Ill., assignor to Tee-Pak, Inc., a corporation of Illinois

Continuation-in-part of application Ser. No. 518,116, Jan. 3, 1966. This application June 16, 1969, Ser. No. 833,423

Int. Cl. A22c *11/00, 13/00*

U.S. Cl. 99—109 10 Claims

Liver sausage and a method of preparing same in the form of a "chub" package comprising an in situ cooked mass of a liver sausage recipe stuffed and encased in an oxygen- and water-impermeable, end-closed casing constituted by a substantially completely stretch-resistant tube formed by jointing and heat seal-seaming a laminate of a metal foil double-face coated with film-forming thermoplastic material.

3,560,224

METHOD OF MAKING CHEESE

Carl Olof Claesson and Ella Marjory Helena Claesson, Uppsala, Sweden, assignors to Alfa-Laval AB, Tumba, Sweden, a corporation of Sweden

Continuation-in-part of application Ser. No. 611,879, Jan. 26, 1967. This application Sept. 16, 1969, Ser. No. 858,492

Claims priority, application Sweden, Jan. 28, 1966, 1,169/66

Int. Cl. A23c *19/02*

U.S. Cl. 99—116 3 Claims

In the processing of milk to produce cheese, it is initially treated by adding carbon dioxide thereto, preferably until the milk acquires a pH value of about 6.0 to 6.5, where-

by differences in the coagulation properties of different batches of milk are reduced, the coagulation time is reduced and a well developed curd is obtained.

3,560,225
EMULSIFIER COMPOSITION FOR CONFECTIONERY PRODUCTS

Bronislaw R. Wonsiewicz, Naperville, Fred R. Paulicka, Chicago, and William E. Wester, Orland Park, Ill., assignors to SCM Corporation, New York, N.Y.

No Drawing. Filed Dec. 16, 1966, Ser. No. 602,174
Int. Cl. A23g *3/00*
U.S. Cl. 99—118 **3 Claims**

Emulsifier ester compositions comprising a phospholipid, a partial ester of polyatomic alocohol and a saturated aliphatic fatty acid and (optionally) a mixture of partial esters of glycerol and saturated aliphatic fatty acid have been prepared. Confectionery hard butter compositions comprising a hard butter having the emulsifier composition dispersed therein and high surface gloss confectionery formulations containing the hard butter compositions have also been prepared. Improved processes for enhancing and maintaining the surface gloss of confectionery formulations are described.

3,560,226
METHOD FOR PRODUCING FLAVORED OR COLORED CONFECTIONERY FOOD PRODUCTS

Maurie Laskin, Milwaukee, Wis., assignor to W. R. Grace & Co.

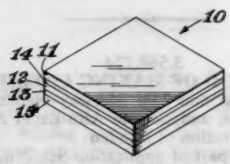
No Drawing. Filed June 6, 1967, Ser. No. 643,826
Int. Cl. A23g *3/00, 5/00;* A21d *13/08*
U.S. Cl. 99—130 **7 Claims**

Flavored and/or colored rehydratable, cellular, substantially dry freeze-dried confectionery food products are produced by adding a suitable amount of flavoring and/or coloring agent to the repressurizing gas stream which is used in bringing the freeze-drying chamber back to atmospheric pressure after the product has been dried to the desired moisture content at reduced subatmospheric pressures.

3,560,227
HIGH BARRIER COATED PAPERS COMPRISING A FILM OF RESINOUS POLYOLEFIN AND RESINOUS BARRIER LAYER WHICH IS ADHERED TO A PAPER SUBSTRATE THROUGH AN OLEFIN ADHESION PROMOTING LAYER

Jacob Eichhorn and Stanley F. Roth, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

Filed Jan. 17, 1968, Ser. No. 698,613
Int. Cl. B32b *27/08, 27/10*
U.S. Cl. 99—171 **16 Claims**

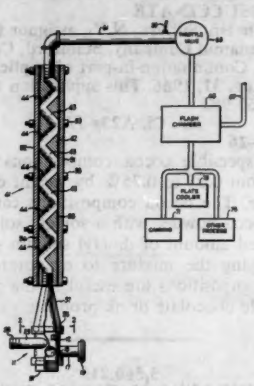


A new and useful high barrier film is described along with a method for its preparation. A layered polyolefin-halohydrocarbon melt is directly extruded onto a pretreated paper substrate to obtain a novel high barrier coated paper.

3,560,228
METHOD FOR HEATING HEAT SENSITIVE FLUIDS

Martin E. Engel, Park Ridge, Ill., assignor to Kraftco Corporation, a corporation of Delaware

Original application Oct. 5, 1965, Ser. No. 493,162, now Patent No. 3,450,022, dated June 17, 1969. Divided and this application Dec. 31, 1968, Ser. No. 788,164
Int. Cl. A23c *3/02*
U.S. Cl. 99—212 **3 Claims**



A method for subjecting heat sensitive liquids to high temperature short-time treatment. The method is effected by combining a heated gas with the heat sensitive liquid in a particular manner to effect thorough and uniform mixing of the gas in the heat sensitive liquid.

3,560,229
COLORFORMING COMPOSITIONS AND METHODS FOR PREPARING AND CONTROLLING SAME

Norman W. Farnham, Webster, and Earl J. Gosnell, Rochester, N.Y., assignors to Burroughs Corporation, Detroit, Mich., a corporation of Michigan

No Drawing. Continuation-in-part of application Ser. No. 526,342, Feb. 10, 1966, which is a continuation-in-part of applications Ser. No. 135,294, and Ser. No. 135,314, Aug. 31, 1961. This application May 15, 1969, Ser. No. 825,036
Int. Cl. C09d *11/00*
U.S. Cl. 106—21 **10 Claims**

The present invention relates to novel colorforming compositions. In particular, the invention relates to colorforming compositions including colorless or light colored chromogenous lactone compounds and reactive phenolic compounds, and methods for preparing the compositions and for the control of the appearance and stability of color in the presence of heat or water by the inclusion of certain organic solvents in the colorforming composition.

3,560,230
SET RETARDED PORTLAND CEMENT COMPOSITION

Robert W. Previte, Lawrence, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 8, 1969, Ser. No. 789,969
Int. Cl. C04b *13/26*
U.S. Cl. 106—90 **4 Claims**

The setting time of hydraulic cement compositions (e.g. portland cement concrete)) is retarded by the addition of N,N-dimethyloldihydroxyethyleneurea to the composition.

3,560,231

PREPARATION OF FOAMED ALUMINUM SALT-FIBER COMPOSITIONS

Earl P. Moore, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 508,391, Nov. 17, 1965, which is a continuation-in-part of application Ser. No. 457,799, May 21, 1965, now abandoned. This application Dec. 22, 1967, Ser. No. 692,641

Int. Cl. C04b *21/02, 43/00*

U.S. Cl. 106—122 10 Claims

Foams of basic aluminum salts and fibrous materials are prepared by mixing from 2 to 40 weight percent of a water dispersible polymeric basic aluminum salt, such as basic aluminum chloride, with water and from 0.02 to 4 percent of an anionic organic acid compound containing from 6 to 18 carbon atoms per acid group, such as sodium lauryl sulfate, and from 2 to 10 parts by weight, based on the weight of basic aluminum salt, of macrofibrous material such as wood pulp and foaming the mixture. The resulting foams dry to form rigid strong low-density structures.

3,560,232

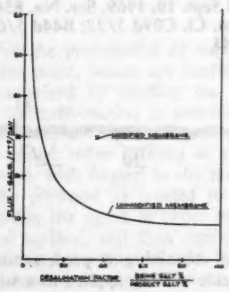
MODIFIED CELLULOSE ESTER SEMIPERMEABLE MEMBRANE AND ITS METHOD OF MANUFACTURE

Fred E. Littman, Santa Ana, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif., a corporation of Maryland

Filed Dec. 29, 1967, Ser. No. 694,709

Int. Cl. B29d *27/04;* C08b *3/00*

U.S. Cl. 106—169 10 Claims



Cellulose ester, especially cellulose acetate, semipermeable membranes having superior permeation properties of flux and solute rejection which are particularly suited for desalination of aqueous salt solutions by reverse osmosis produced by a method which includes pretreatment of the cellulose ester material in the form of an inert solvent solution with catalytic amounts of a concentrated strong acid prior to casting the cellulose ester material into a film. Method for producing the above described membrane, and method for desalination of salt water employing the above described membrane.

3,560,233

PROCESS FOR PRODUCING ZIRCONIUM-VANADIUM-SILICA PIGMENT

Alfred L. Hock, Manchester, England, assignor to Magnesium Elektron Limited, Manchester, England

No Drawing. Continuation-in-part of application Ser. No. 622,023, Mar. 8, 1967. This application Sept. 12, 1969, Ser. No. 857,541

Int. Cl. C09c *1/00*

U.S. Cl. 106—299 1 Claim

A process for producing zirconium-vanadium-silica pigment comprising heating mixture of zirconium oxide, silica, vanadium pentoxide (or a vanadium compound which gives the pentoxide on heating), an alkali-metal fluoride and a substance containing sulphur oxy-acid ions which are substantially or completely volatile in the heating stage of the pigment-making process.

3,560,234

PROCESS FOR THE MANUFACTURE OF PIGMENTS OF TITANIUM DIOXIDE IN THE RUTILE FORM

Raymond G. Holbein, Thann, France, assignor to Fabriques de Produits Chimiques de Thann et de Mulhouse, Thann, France

No Drawing. Filed Mar. 3, 1969, Ser. No. 803,938

Int. Cl. C09c *1/36*

U.S. Cl. 106—300 13 Claims

A titanium dioxide rutile pigment of good brightness, colour, and other favourable properties is made by adding a rutile seed to a titanium sulphate solution, hydrolysing the titanium sulphate to a hydrous titanium dioxide gel, adding further rutile seed (preferably prepared in a different way), an alkali metal compound, a zinc compound, and an unusually high proportion of phosphoric acid or a phosphate, drying the gel containing the additives, and calcining it, preferably at about 1000° C.

3,560,235

DISPERSIONS

Donald Thomas Sarfas and Arthur Topham, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed June 21, 1968, Ser. No. 738,786

Claims priority, application Great Britain, June 22, 1967, 28,823/67

Int. Cl. C09c *3/02*

U.S. Cl. 106—308 12 Claims

Non-flocculating pigment compositions, suitable for use in printing inks and paints, are prepared by bleeding pigments with essentially colourless compounds containing at least one urea or urethane group and at least one basic amino group, preferably a tertiary amino group, not attached to an aromatic nucleus.

3,560,236

METHOD AND COMPOSITION FOR PREFERENTIALLY GLAZING CERAMIC BODIES

William H. Orth, Baltimore, Md., assignor to SCM Corporation, Cleveland, Ohio

No Drawing. Filed Dec. 30, 1968, Ser. No. 788,058

Int. Cl. B44d *1/52, 3/20*

U.S. Cl. 117—5.5 4 Claims

This application discloses a method and composition for preferentially glazing predetermined areas of unfired (green) or fired ceramic articles. Those areas of the ceramic article that are to remain unglazed are coated with a film of substantially combustible, discrete (non-coalescing), hydrophobic particles prior to the application of an aqueous glazing slip. The aqueous glazing slip is then applied to the article by dip, spray, brushing, flow-coat, or waterfall methods and the slip adheres only to those areas which are not hydrophobically coated. The resulting body is then fired to fuse or mature the glaze and burn away the hydrophobic coating.

The invention makes possible the use of the waterfall method of applying aqueous glazing slip to unfired shaped (e.g., pressed, extruded, etc.) ceramic bodies which are to be preferentially glazed on the planar surface and not the edges thereof.

3,560,237

PROCESS OF CURING POLYMERIZABLE RESINS HAVING TERMINAL VINYL ESTER GROUPS USING HIGH ENERGY ELECTRONS

Lewis S. Miller, Bellevue, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

No Drawing. Filed Apr. 15, 1968, Ser. No. 721,152
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 18 Claims

A process of coating a porous or nonporous substrate with a liqjuid polymerizable film and subjecting the coated substrate to ionizing radiation sufficient to impart to the coating composition a dose of from 1 to 10 megarads in one second or less. The coating compositions, capable of substantially complete polymerization in less than one second, contain undiluted vinyl ester resins having terminal vinyl ester groups, or the above dissolved in vinyl monomers. The vinyl ester resins are made by reacting:

(1) A polyfunctional material selected from the group consisting of (a) dicarboxylic acids having from 4 to 15 carbon atoms, (b) polyepoxides having terminal, reactive glycidyl groups, (c) polyfunctional isocyanates having terminal, reactive isocyanate groups, or (d) dicarboxylic acid esters of polyepoxides, polyamines, polyisocyanates, with
(2) 2-hydroxyalkyl acrylates or methacrylates.

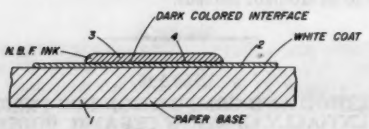
Particularly useful are coating compositions containing resins having terminal acrylate groups and an acrylate monomer, the polyfunctional acrylate having more than one 2-oxyalkylacrylate end group per molecule with the end groups being joined by a hydrophobic molecule such as a dicarboxylic acid, polyfunctional isocyanate or polyepoxide.

3,560,238

METHOD FOR PRINTING VISIBLE CHARACTERS WITH NARROW BAND FLUORESCENT INKS

John L. Rothery, Concord, Mass., assignor, by mesne assignments, to American Cyanamid Company, Stamford, Conn., a corporation of Maine

Filed May 26, 1967, Ser. No. 641,606
Int. Cl. C09d *11/00, 11/16*
U.S. Cl. 117—12 2 Claims



Information, such as typewritten symbols, is made both in visibly readable form and in a code in which one or more narrow-band fluorescent materials are present in inks for particular symbols, the presence or absence of the components being detectable by ultraviolet illumination and detection of the particular fluorescent radiation produced.

Paper or other substrate is coated with a material which is capable of reacting with color forming components in the inks to form visible color images. The ink is transparent so that ultraviolet light which is used for the determination of the code can pass into it without being absorbed or attenuated by colored pigments. The visual component for optical reading forms a boundary under the fluorescent ink next to the paper and can be observed through the transparent ink. All of the advantages of sensitive response to ultraviolet light for code reading and the capability of visual reading are retained without offsetting disadvantages.

3,560,239

METHOD OF COATING AN ELONGATED BODY

Walter K. Facer, Parma, Ohio, and Jane H. M. Rigo, Monroeville Borough, Pa., assignors to United States Steel Corporation, a corporation of Delaware

Original application Mar. 25, 1964, Ser. No. 354,594, now Patent No. 3,476,081. Divided and this application July 10, 1969, Ser. No. 840,750
Int. Cl. B44d *1/095, 1/42*
U.S. Cl. 117—17 5 Claims

A continuous method of coating a clean steel wire or the like with resin includes applying a primer to the wire, drying the primer coating before heating it and preheating the primed object by passing it through an induction coil with the primer coating thereon and at the same time applying a cooling gas thereto to purge priming fumes and to keep the induction coil free of accumulations. The heated wire is then passed horizontally through a fluidized bed of powdered resin after which the coating is fused on the wire.

3,560,240

CRACKLING COAT PROCESS AND APPARATUS

Charles C. Simmons, Skokie, Ill., assignor to Enameled Steel & Sign Co., Inc., Chicago, Ill., a corporation of Illinois

Filed Sept. 10, 1969, Ser. No. 856,785
Int. Cl. C09d *5/28;* B44d *5/06*
U.S. Cl. 117—41 11 Claims

A method of obtaining a predetermined pattern or design in a crackle coating applied to a surface by texturing said surface with said pattern or design prior to application of said crackle coating. Upon drying, the crackle coat separates at points of indentation in the textured surface, forming a crackle design in a predetermined or predictable pattern as distinguished from a random crackle pattern. The color of the surface, or a base coat, shows through the separations in the crackle coat.

3,560,241

METHOD OF METALLIZING A POLYSULFONE BODY

Kenneth C. Davis, Endwell, and Glenn V. Elmore, Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed Mar. 6, 1968, Ser. No. 710,733
Int. Cl. B44d *1/092*
U.S. Cl. 117—47 5 Claims

A plastic body is metallized by treating it with a solvent for the specific plastic material, followed by treatment in a second solvent which is miscible with the first solvent but is a nonsolvent for the specific material. The solvent treated material is sequentially treated in an acid conditioner, an alkaline cleaning solution, and neutralized in a dilute hydrochloric acid solution prior to metallization. Each step may be preceded by a rinsing step. The

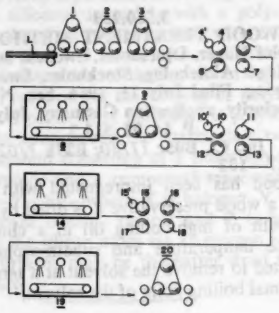
method of the invention provides firmly bonded metal films to polysulfone substrates. The bonded material has peel strengths of about 9 pounds per inch. The method of the invention as described herein is applicable to the manufacture of additive printed circuits.

3,560,242

PROCESS FOR THE PREPARATION OF SURFACED LAUAN PLYWOODS FOR DOORS, READY FOR PAINT

Kingo Urata, Fujikawa-machi, Shizuoka-ken, Japan, assignor to Noda Plywood Mfg. Co., Ltd., Shizuoka-ken, Japan

Filed Dec. 8, 1967, Ser. No. 689,092
Claims priority, application Japan, Oct. 6, 1967, 42/64,070
Int. Cl. B44d *1/14, 1/28*
U.S. Cl. 117—57 2 Claims



A process for the preparation of surfaced lauan plywoods ready for paint, which are useful as door panel material, characterized by sanding the surface of plywoods to be treated; coating a treating agent on the sanded surface, pressure contacting the coated surface with a reverse coater roller rotating at a specific reverse peripheral velocity with respect to the mating feed roller and heating the plywood so treated to a specific temperature to harden the agent in order to obtain a more smooth, leveled surface; and then repeating twice more a serial operations consisting of such coating, pressure contacting and heating as above each under specific conditions in order to obtain a substantially perfectly smooth. leveled surface ready for paint finish.

3,560,243

PROCESS FOR IMPARTING WATER REPELLENCE AND PRODUCTS THEREOF

Ray F. Seifert, Grand Island, Edwin G. Niewadomski, Lewiston, and Warren B. Blumenthal, North Tonawanda, N.Y., assignors to National Lead Company, New York, N.Y.

No Drawing. Filed Apr. 19, 1967, Ser. No. 631,896
Int. Cl. B44d *1/44;* D06m *15/00*
U.S. Cl. 117—62.1 17 Claims

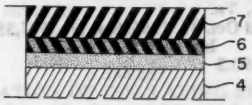
A fabric having thereon a substantially continuous, hydrophobic layer of a fatty acid-hydrous zirconia adsorbate is produced by alterntaely immersing said fabric in an aqueous soap solution and in an aqueous solution of ammonium zirconyl carbonate, which may also contain tetrammine zinc, tetrammine copper, and/or phenylmercury ions, drying after the second immersion, repeating such treatment, and drying said fabric at a temperature of at least 70° C. and preferably 90° C. The adsorbate layer is resistant to washing and dry cleaning solvents; and also where the other mentioned metal ions are included in the metal salt solution imparts resistance to attack by microorganisms.

3,560,244

METHOD FOR BONDING CURABLE MODIFIED ORGANOPOLYSILOXANES TO A SUBSTRATE AND ARTICLE PRODUCED THEREBY

Charles G. Neuroth, Blissfield, Mich., assignor to Stauffer Chemical Company, New York, N.Y., a corporation of Delaware

Filed Mar. 14, 1968, Ser. No. 713,142
Int. Cl. B44d *1/14;* B32b *15/08*
U.S. Cl. 117—71 14 Claims



A method for bonding a room-temperature-curable modified organopolysiloxane to a substrate which comprises applying a zinc dust primer composition to the substrate, coating the dried primer composition with a curable organopolysiloxane and thereafter applying a curable modified organopolysiloxane to the organopolysiloxane coated substrate.

3,560,245

PAINTING POLYOLEFIN SUBSTRATES

Elihu J. Aronoff, Southfield, and Ernest O. McLaughlin, Detroit, Mich., assignors to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

No Drawing. Filed Dec. 4, 1967, Ser. No. 687,495
Int. Cl. B44d *1/14, 1/50*
U.S. Cl. 117—72 13 Claims

A process for painting polyolefin comprising substrates which comprises applying to the surface to be painted a coating material consisting essentially of a liquid compound having two or more unreacted vinyl groups per molecule, exposing this surface to ionizing radiation, applying to the resultant surface a coating of paint that is polymerizable by ionizing radiation and exposing the painted surface to ionizing radiation.

3,560,246

METHOD FOR CATALYZING POLYUREA COATINGS

Billy D. Payne, Cleveland, and James W. Watson, Parma, Ohio, assignors to SCM Corporation, Cleveland, Ohio

No Drawing. Filed Apr. 26, 1968, Ser. No. 724,610
Int. Cl. B44d *1/28, 1/14;* B32b *21/08*
U.S. Cl. 117—72 12 Claims

A novel method for catalyzing the formation of polyurea by the reactions between polyfunctional-isocyanates and polyfunctional-imines through the presence of an effective amount of a phenolic catalyst is provided. One particularly important embodiment comprises the formation of polyurea film coatings on wood substrates by reacting alkylene diisocyanates and alkylene diimines in the presence of a chloro-substituted phenol.

3,560,247

POLYOLEFIN FILM OR NON-WOVEN FABRIC COATED WITH REMOISTENABLE ADHESIVE

William David Robinson, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 1, 1967, Ser. No. 679,607
Int. Cl. B44d *1/14;* C09j *7/02*
U.S. Cl. 117—76 7 Claims

A polyolefin film or non-woven fabric, particularly of polypropylene, having a top coating of a remoistenable adhesive such as partially hydrolyzed polyvinyl alcohol

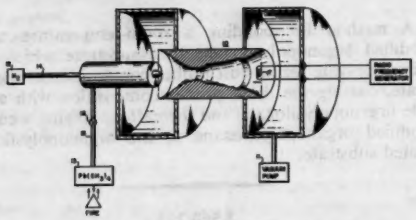
is firmly anchored to the film or fabric through a plasticized coating of a vinyl acetate/dibutyl maleate copolymer or a vinyl acetate/ethylene/unsaturated monocarboxylic acid terpolymer.

3,560,248

METHOD FOR CONTROLLED DEPOSITION OF ELEMENTS ON STRUCTURES OF COMPLEX SHAPES

Doran W. Padgett, 3801 36th Road N. 22207, and Arnold A. Shostak, 3017 S. Buchanan St. 22206, both of Arlington, Va.

Filed Oct. 31, 1966, Ser. No. 591,380
Int. Cl. C23c *11/00*
U.S. Cl. 117—93.2 10 Claims



This invention is directed to a method of depositing metallic elements onto physical structures of complex shapes under carefully controlled conditions. A radio frequency probe is inserted into the structure to be coated and the structure is evacuated. A radio frequency is applied to the inner cavity of the structure for induction heating thereof, then a gaseous metallic compound such as lead tetramethyl is admitted into the cavity and carried through the cavity by a carrier gas such as hydrogen. The radio frequency heats the structure and the gaseous metallic compound directed into the cavity decomposes with the result that the lead ions deposit onto the surface of the cavity. The method is carried out sufficiently to deposit a coating of a desired thickness. The probe may be moved axially through the cavity and the radio frequency decreased which will reverse the chemical reaction to smooth out the deposited coating.

3,560,249

METHOD FOR PRODUCTION OF POLYTETRAFLUOROETHYLENE MULTILAYER COATINGS ON HEAT-RESISTANT MATERIALS

Lev Vikentievich Chereshkevich, Ulitsa Vasenko 5/15, kv. 29; Dmitry Dmitrievich Chegodaev, Ulitsa Fedoseenko 19, kv. 39; and Nadezhda Elizarovna Yavzina, Ulitsa Tipanova 5, kv. 80, all of Leningrad, U.S.S.R.

No Drawing. Filed Sept. 23, 1968, Ser. No. 761,836
Int. Cl. B44d *1/14*
U.S. Cl. 117—93.4 6 Claims

A method for the production of polytetrafluoroethylene multilayer coatings on heat-resistant materials which comprises depositing an aqueous dispersion of polytetrafluoroethylene onto said materials, followed by drying the deposited dispersion layer and baking the resultant layer of the polymer, wherein in the course of depositing the second and subsequent layers of the aqueous dispersion and/or immediately prior to dispersion deposition the surface of said materials is rubbed against a material capable of producing, on friction, a negative electrostatic charge on the surface of polytetrafluoroethylene.

3,560,250

MATERIAL AND PROCESS FOR THE MANUFACTURE OF COATINGS ON CELLULOSE HYDRATE FILM

Wilhelm Brandt and Irmgard Bindrum, Wiesbaden-Biebrich, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed Dec. 1, 1966, Ser. No. 598,197
Claims priority, application Germany, Dec. 4, 1965, K 57,829
Int. Cl. B44d *1/50*; B32b *23/08*
U.S. Cl. 117—93.31 4 Claims

A process which comprises applying onto the surface of a regenerated cellulose hydrate film an aqueous dispersion of a vinylidene chloride copolymer and a solution containing a phenoplast or an aminoplast in a water-diglycol mixture, and heating the surface of the film with a high frequency field or infrared radiation to a temperature range of 120° to 140° C., and product of said process.

3,560,251

WOOD TREATMENT METHOD

Bror Olof Hager, Djursholm, Sweden, assignor to Hager Aktiebolag, Stockholm, Sweden

No Drawing. Filed July 11, 1966, Ser. No. 563,979
Claims priority, application Germany, July 19, 1965, P 14 92 511.2
Int. Cl. B05c *11/10*; B27k *3/02*
U.S. Cl. 117—102 5 Claims

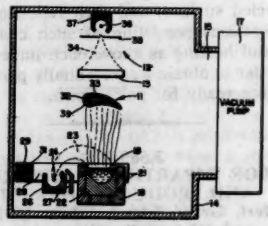
After wood has been impregnated with an aqueous solution of a wood preservative it is dried by heating it in a heated bath of high-boiling oil in a chamber, under vacuum, the temperature and subatmospheric pressure being adjusted to remove the solvent at a temperature below the normal boiling point of the solvent.

3,560,252

VAPOR DEPOSITION METHOD INCLUDING SPECIFIED SOLID ANGLE OF RADIANT HEATER

Kurt D. Kennedy, Berkeley, Calif., assignor to Air Reduction Company, Incorporated, New York, N.Y., a corporation of New York

Filed Aug. 13, 1968, Ser. No. 752,252
Int. Cl. C23c *13/02*
U.S. Cl. 117—107 7 Claims



A method for vapor depositing a material on a substrate wherein the substrate is heated by radiant heaters maintained at temperatures sufficiently high to prevent condensation of vapor thereon and of a configuration which prevents overheating of the substrate.

3,560,253

FIRE RESISTANT COATED MASONRY STRUCTURAL UNITS

Robert J. Ashton, Toronto, Ontario, Canada, assignor to SCM Corporation, Cleveland, Ohio

No Drawing. Filed June 19, 1968, Ser. No. 738,099
Claims priority, application Canada, Apr. 27, 1968, 18,627
Int. Cl. C03c *17/32*
U.S. Cl. 117—123 6 Claims

Coated masonry structural units exhibiting unusual fire and flame resistance, and thermal stability are provided.

These units comprise a masonry substrate such as concrete or cinder block, coated with a polyester composition containing hydrated alumina as the primary thermal stabilizer and fire retardant. Secondary fire retardants such as antimony can also be employed. The coating is formed by curing a thermosetting polyester composition containing alumina hydrate, unsaturated polyester, and monomeric compound copolymerizable therewith.

3,560,254

GRAFTING POLYMERS ON GLASS AND LIKE SILICEOUS MATERIALS

John David Seddon, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Sept. 8, 1966, Ser. No. 577,826
Claims priority, application Great Britain, Sept. 16, 1965, 39,583/65
Int. Cl. C08f *1/76*
U.S. Cl. 117—124 11 Claims

There is provided a process for coating the surface of glass and like siliceous materials with a polymeric material wherein the glass is first treated with a compound which forms a chemical bond with the surface of the glass and is also capable of acting as an initiator in a polymerization reaction for the coating of polymeric material. Suitably a polar vinyl monomer is polymerized by initiation of the coating and the coating is a two-component initiator system consisting of a transition metal carbonyl or isocyanide and a compound represented by the formula $X_3C—Y—SiZ_3$ where X is halogen, Y is a direct link or a divalent organic radical and Z is halogen or alkyl linked to the silicon atom via an oxygen atom. Such coated glass surfaces may be thereafter dyed to present a colored surface.

3,560,255

COMPOSITE WOOD-POLYMER PRODUCT

Jack Maine, Saginaw, Mich., assignor to C. W. Maine & Sons, Inc., Saginaw, Mich.

No Drawing. Filed Mar. 18, 1968, Ser. No. 714,066
Int. Cl. B44d *1/28;* B27k *3/34*
U.S. Cl. 117—148 3 Claims

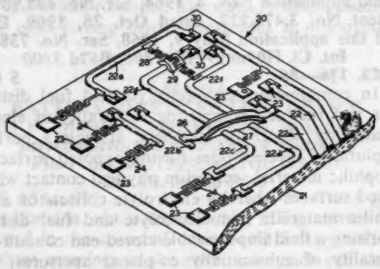
A composite wood-polymer product comprising wood impregnated from its surface inwardly with a polymer of tert-butylstyrene whereby the surface is substantially as tough as Formica and the composite product advantageously can be used in the manufacture of furniture such as desks, chairs, cabinets and the like. This invention also relates to a method for the preparation of such a composite product.

3,560,256

COMPOSITE THICK AND THIN FILM CIRCUITS

Halle Abrams, Allentown, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y., a corporation of New York

Filed Oct. 6, 1966, Ser. No. 584,894
Int. Cl. H05k *1/04, 3/16*
U.S. Cl. 117—212 25 Claims



A thick and thin-film circuit includes at least three glazed conductors, a glazed dielectric formed over one of the conductors, and a thin-film crossover resistor formed over the dielectric and connected to the other conductors. The resistor is formed from a film which is resistant to most atmospheres and solutions which would attack the conductors and adversely affect their electrical and physical integrity. A portion of this film is left over the conductors to protect them from such atmospheres and solutions. Where the film can be bonded to the substrate with a bond stronger than that between the conductors and the substrate, as is the case of sputtered tantalum nitride, another portion of the film is left on the substrate to extend over the conductors to form tabs on opposite sides of such conductors to thereby more firmly secure the conductors to the substrate.

3,560,257

METALLIZATION OF INSULATING SUBSTRATES

Frederick W. Schneble, Jr., and Edward J. Leech, Oyster Bay, and Joseph Polichette, South Farmingdale, N.Y., assignors to Photocircuits Division of Kollmorgen Corporation, Hartford, Conn., a corporation of New York

Filed Jan. 3, 1967, Ser. No. 606,919
Int. Cl. B44d *1/14, 1/34, 1/18*
U.S. Cl. 117—212 21 Claims

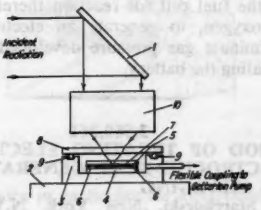
A method for rendering insulating compositions receptive to the deposition of an electroless metal is provided which comprises utilizing in such compositions an organic compound of a metal which is a member selected from the metals in Groups 1–B and 8 of the Periodic Table of Elements, including mixtures of such compounds.

3,560,258

PATTERN DEPOSIT BY LASER

Alan Douglas Brisbane, Epping, England, assignor to International Standard Electric Corporation, New York, N.Y., a corporation of Delaware

Filed May 31, 1967, Ser. No. 642,403
Claims priority, application Great Britain, July 22, 1966, 33,047/66
Int. Cl. H01s *3/00;* C23c *13/04*
U.S. Cl. 117—212 10 Claims



A technique for forming an interconnection pattern on a substrate by placing opposite the substrate a film of a vaporizable material disposed on a glass plate. A beam of intense radiant energy scans the metallic film through the glass plate to selectively evaporate portions of the film which deposit on the semiconductor substrate in accordance with the desired pattern.

3,560,259

METHOD OF RECLAIMING TANTALUM FROM TANTALUM SUBSTRATES HAVING OXIDES OF TANTALUM THEREON

Robert S. Moore, Pittsford, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed Dec. 4, 1969, Ser. No. 882,136
Int. Cl. C23g *1/02*
U.S. Cl. 134—41 4 Claims

A method of reclaiming tantalum from a tantalum substrate having oxides of tantalum thereon. The tan-

talum oxide covered substrate is contacted with molten $KHSO_4$ at a temperature in the range of 210° C. to 450° C. and in a weight ratio of at least two parts of $KHSO_4$ to one part of combined oxides. The substrate is maintained within the above temperature range for a period of time sufficient to dissolve the oxides and form a solution. The solution covered substrate is then treated with water to remove the solution therefrom to yield an essentially oxide-free tantalum substrate.

3,560,260

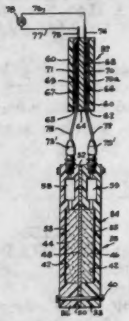
METHOD OF ELIMINATING GAS PRESSURE IN BATTERIES BY USING GAS IN FUEL CELL

Carl Berger, Corona Del Mar, Calif., assignor, by mesne assignments, to McDonnell Douglas Corporation, Santa Monica, Calif., a corporation of Maryland

Continuation of application Ser. No. 395,681, Sept. 11, 1964. This application Jan. 24, 1969, Ser. No. 797,350

Int. Cl. H01m *1/08, 27/14, 43/00*

U.S. Cl. 136—3 **6 Claims**



Combination of a fuel cell with a battery arranged with a conduit means between the battery and the fuel cell so that gas generated in the battery, e.g., hydrogen, is conducted to the fuel cell for reaction therein with another gas, e.g., oxygen, to generate an electric current and thereby eliminate gas pressure developed in the battery and also sealing the battery.

3,560,261

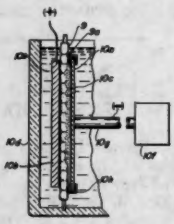
METHOD OF TREATING ELECTRODE OF ELECTROCHEMICAL GENERATOR DURING CHARGING

Zbigniew Starchurski, New York, N.Y., John O'M. Bockris, Philadelphia, Pa., and George Abbe Dalin, Union, N.J., assignors to Yardney International Corp., New York, N.Y., a corporation of New York

Continuation of application Ser. No. 441,069, Mar. 19, 1965. This application July 31, 1968, Ser. No. 749,925

Int. Cl. H01m *15/00, 29/04*

U.S. Cl. 136—6 **3 Claims**



A rechargeable electrochemical current generator with two electrodes of opposite polarities, having generally planar confronting working surfaces immersed in an electrolyte in which the active material (e.g. zinc) of the negative electrode is soluble, is charged with continuous displacement of the negative electrode in the plane of its working surface, such as rotation about an axis, to prevent the short-circuiting of the system by the growth of dendritic formations from the negative electrode to the positive counterelectrode. A stationary wiper may be held against the working surface of the negative electrode during its rotation to help smooth its active layer.

3,560,262

ELECTRODE WITH A NON-WOVEN FABRIC BASE AND ELECTROPLATED COATINGS OF NICKEL

Hideo Baba, Tokyo, and Yoshio Yamashita, Yokohamashi, Kanagawa-ken, Japan, assignors to Sony Corporation, Tokyo, Japan, a corporation of Japan

Filed Dec. 6, 1968, Ser. No. 781,922

Claims priority, application Japan, Dec. 8, 1967, 43/103,176

Int. Cl. H01m *35/30*

U.S. Cl. 136—76 **4 Claims**

A battery electrode is composed of a porous fabric base, such as, non-woven nylon, on which there is non-electrolytically plated a thin coating of conductive metal onto which there is electroplated a relatively thick coating of metal, such as nickel, and the thus plated base then has an active material, such as nickel hydroxide or cadmium hydroxide deposited in its pores. An electrode terminal may be connected directly to the resulting electrode structure or two such bases may be sandwiched together with a nickel mesh interposed therebetween and with the electrode terminal attached to the mesh.

3,560,263

ELECTROLYSIS

Dominicus A. J. Swinkels, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

No Drawing. Filed Oct. 5, 1966, Ser. No. 584,341

Int. Cl. H01m *27/00;* **C22d** *3/06;* **B01k** *3/00*

U.S. Cl. 136—86 **7 Claims**

Improvement to process for electrolytically dissociating fused alkali metal halides by adding an alkali metal to the fused halide to cause increased wetting of the carbon or graphite anodes by the fused halides. A preferred current reversal pulsing technique for introducing the alkali metal into the halide is described.

3,560,264

FUEL CELL WITH ELECTROLYTE OR FUEL DISTRIBUTOR

Royce E. Biddick, Edina, Minn., assignor, by mesne assignments, to Union Oil Company of California, Los Angeles, Calif., a corporation of California

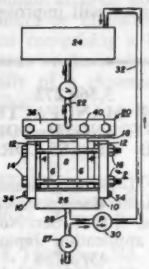
Original application Nov. 4, 1964, Ser. No. 408,909, now Patent No. 3,475,222, dated Oct. 28, 1969. Divided and this application May 9, 1968, Ser. No. 738,747

Int. Cl. H01m *27/12, 7/00;* **B67d** *3/00*

U.S. Cl. 136—86 **5 Claims**

1. In combination an electrolyte and fuel distributor means and fuel cell comprising a plurality of electrodes separated by absorbent members, at least a portion of said plurality of electrodes having exposed surfaces and hydrophilic material secured in physical contact with said exposed surfaces whereby electrolyte collects on said hydrophilic material; said electrolyte and fuel distributor comprising a fluid impermeable closed-end conduit having a plurality of substantially co-planar apertures; a fluid absorbent element coextensive with and occupying at least a portion of the enclosure formed by said conduit, siphon-fluid conducting means extending through each of

said apertures, one end of said siphon means contacting said fluid absorbent element, the other end of said siphon means adapted to communicate at least one of electrolyte



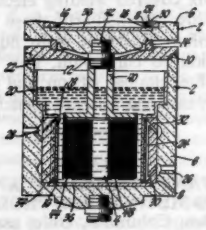
and fuel to said absorbent members in said fuel cell; and means provided in said conduit through which at least one of electrolyte and fuel can be supplied thereto.

3,560,265

GALVANIC CELL WITH A MATRIX ELECTRODE

Gale M. Craig, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed July 8, 1968, Ser. No. 743,170
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 **8 Claims**



A matrix electrode for the molten lithium of a

$$Li|LiCl|Cl_2$$

fuel cell, which electrode is a porous bundle of specifically oriented filaments of a material which is preferentially wetted by the lithium. A particular filament bundle has spacer filaments intermittently disposed between layers of woven or meshed filaments. A simply sealed battery of cells having matrix electrodes is described.

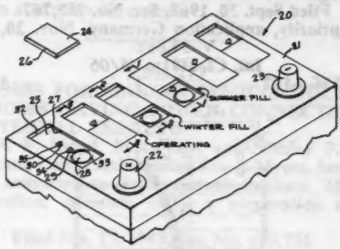
3,560,266

BATTERY SAFETY FILLING DEVICE

Eugene W. Mossford, Novelty, Ohio, assignor to ESB Incorporated, a corporation of Delaware

Filed Nov. 29, 1968, Ser. No. 779,701
Int. Cl. H01m *7/00*
U.S. Cl. 136—177 **6 Claims**

An automatic, dual level, safety filling device is incorporated in the cover of a lead acid battery and comprises three openings in the cover over each cell and are referred to as the winter hole, summer hole, and vent hole respectively. A closure is slidably attached to the cover to close the winter and summer holes, or the summer and the vent holes, or the vent hole only. When the battery needs servicing, water or electrolytic solution is poured into the uncovered winter hole and depending upon



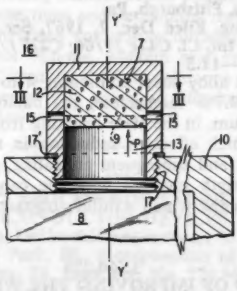
whether the closure covers the summer hole and the vent hole, or the vent hole only the solution in the cell rises to a "winter level" or to a "summer level" respectively.

3,560,267

VALVING DEVICE FOR ELECTROCHEMICAL GENERATORS OR THE LIKE

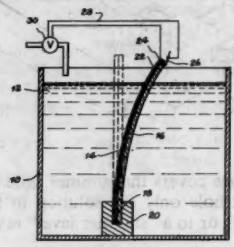
Jean P. Guilliams, Paris, France, assignor to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme), Romainville, Seine-Saint-Denis, France, a company of France

Filed Nov. 19, 1968, Ser. No. 777,118
Claims priority, application France, Nov. 22, 1967, 129,269
Int. Cl. H01m *1/06*
U.S. Cl. 136—178 **14 Claims**



A valving device in particular for electrochemical generators of semi-sealed type capable of providing exit communication between the enclosure of the generator and the exterior environment, the valving device being of a type comprising a hollow part having a cavity in communication with said enclosure and the exterior via one or more exit orifices or passages which place the enclosure in communication with the exterior environment and including an obturating elastic body lodged in such cavity and capable of volumetric change for freeing or clearing said exit orifices or passages under given differential pressures appearing between said enclosure and said exterior enviromnent and sealing or obturating said orifices or passages when said pressure differential conditions are not present. The obturating body lodged in the cavity is compressible and elastic and its volume is variable and decreases as pressure upon it increases, being constituted primarily of an elastic porous or alveolate body whose pores or cells are sealed off and contain gas such as imprisoned air that is compressible. The variation in elastic volume of the body is obtained thanks to the compressibility of the imprisoned gas in one or more of the pores or cells that are bounded by elastic partitioning walls.

3,560,268
DEVICE FOR MEASURING ELECTROLYTE CONCENTRATION
August Winsel, Kelkheim, Germany, assignor to Varta Aktiengesellschaft, Frankfurt am Main, Germany
Filed Sept. 30, 1968, Ser. No. 763,767
Claims priority, application Germany, Nov. 20, 1967, V 34,862
Int. Cl. H01m *45/06*
U.S. Cl. 136—182 **3 Claims**



Bi-plastic strips for measuring the concentration of electrolyte in galvanic cells are formed from a strip of ion exchange material which swells in the electrolyte and a strip of a second material which is stable in the electrolyte and has a low bending moment. The two strips are used in a back-to-back relation with one end of the strip immobile and one end mobile.

3,560,269
NON-EARING ALUMINUM ALLOY SHEET
William A. Anderson, Pittsburgh, and John K. McBride, New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
No Drawing. Filed Dec. 7, 1967, Ser. No. 688,681
Int. Cl. C22c *21/00*; C22f *1/04*
U.S. Cl. 148—11.5 **8 Claims**

Aluminum alloy sheet containing 4 to 5.5% magnesium, 0.2 to 0.7% manganese, the balance being essentially aluminum, in the state resulting from a cold rolling reduction which effects a reduction in the thickness of at least 85% and subsequent annealing, possesses a high level of strength together with the capability of being drawn into cups which exhibit substantially no earing.

3,560,270
METHOD OF IMPROVING THE WELDABILITY OF TITANIUM SHEET STEEL
David W. Reinbold, Bethlehem, Pa., and James L. Forand, Jr., Baltimore, and Walter L. Stitz, Ellicott City, Md., assignors to Bethlehem Steel Corporation
No Drawing. Filed Dec. 23, 1966, Ser. No. 604,184
Int. Cl. C21d *7/14, 9/46*
U.S. Cl. 148—12 **3 Claims**

A method for improving the weldability of titanium sheet steel comprising coiling the sheet, as it comes off the hot mill at temperatures not lower than 1250° F.

3,560,271
NITRIDING METHOD
Hans Heinen, Meinerzhagen, Germany, assignor to Otto Fuchs, Meinerzhagen, Germany
Filed May 16, 1968, Ser. No. 730,216
Claims priority, application Germany, May 17, 1967, F 52,437
Int. Cl. C23c *9/14*; C21d *1/74*
U.S. Cl. 148—15.5 **7 Claims**

Metallic work pieces, particularly alloyed steel work pieces are nitrided at temperatures above 500° C. and are then conveyed into a pressure vessel at such speed that during conveying of the work piece the temperature thereof will drop relatively little, not more than 100° C. and preferably so that the workpiece when introduced into the pressure vessel still has a temperature of at least about 500° C. Promptly after introduction of the hot work piece, the pressure vessel is evacuated and the hot work piece is allowed to cool by heat radiation while being located in the evacuated pressure vessel. Cooling in the above described manner will improve the quality of the nitrided work piece.

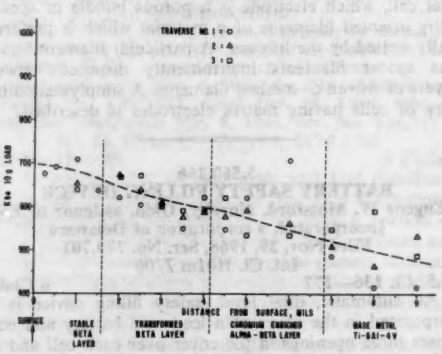
3,560,272
METHOD FOR MANUFACTURING HIGH TENSILE STRENGTH BOLTS HAVING ENHANCED STRESS-CORROSION RESISTANCE
Takao Yamazaki, 1–18 Kugenuma-kaigan, 6-chome, Fujisawa-shi, Kanagawa-ken, Japan
Filed Dec. 4, 1968, Ser. No. 781,106
Claims priority, application Japan, Jan. 22, 1968, 43/3,228
Int. Cl. C21d *1/74, 1/80*
U.S. Cl. 148—16 **3 Claims**

A method of manufacturing high tensile strength bolts which have excellent stress-corrosion resistance and mechanical properties, and bolts manufactured by the method. The method comprises the steps of decarburizing the surface layer of the bolt to a depth of about 0.2 mm., heating the bolt and then quenching and tempering the decarburized bolt.

3,560,273
WELDING FLUX FOR JOINING COPPER-NICKEL ALLOYS
Walter A. Petersen, Ridgewood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.
No Drawing. Filed July 1, 1968, Ser. No. 741,286
Int. Cl. B23k *35/36*
U.S. Cl. 148—24 **5 Claims**

A flux and flux covered welding electrode for welding copper-nickel alloys, particularly those containing chromium. If chromium is absent from flux, weld cracking likely. In addition to chromium, flux contains calcium carbonate, cryolite, titania, silicon and titanium. Use of manganese carbonate and bentonite beneficial.

3,560,274
WEAR-RESISTANT TITANIUM AND TITANIUM ALLOYS AND METHOD FOR PRODUCING SAME
Horace R. Ogden, Columbus, Ohio, assignor to International Business Machines Corporation, Armonk, N.Y., a corporation of New York
Continuation of application Ser. No. 568,903, July 29, 1966. This application Oct. 10, 1969, Ser. No. 866,151
Int. Cl. C23b *5/06, 5/52*; B32b *15/00*
U.S. Cl. 148—31.5 **14 Claims**



Producing a titanium or titanium alloy base metal article having a hard surface region of high adherence com-

prising plating the surface of the base metal with a layer consisting essentially of chromium to a maximum thickness of 0.5 mil and diffusion annealing the plated article to substantially completely diffuse the chromium into the base, thereby forming a chromium-stabilized surface layer of beta titanium-chromium alloy on said base metal.

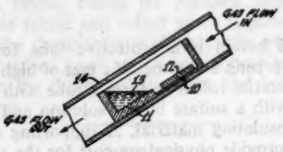
An article of titanium or titanium alloy base metal having a hard surface comprising a body of said base metal and a diffused zone on the surface of the base metal consisting of essentially of a chromium-stabilized, beta titanium-chromium alloy.

3,560,275

FABRICATING SEMICONDUCTOR DEVICES

Henry Kressel, Elizabeth, and Frank Z. Hawrylo, Trenton, N.J., assignors to RCA Corporation, a corporation of Delaware

Filed Nov. 8, 1968, Ser. No. 774,421
Int. Cl. H01l 7/38
U.S. Cl. 148—171 8 Claims



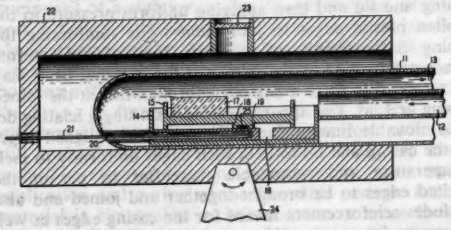
A PN junction is formed in a solution grown epitaxial layer consisting of a mixed III–V compound semiconductive material by utilizing a single amphoteric conductivity modifier in the solution, and varying the temperature of the solution during the deposition of the epitaxial layer. The semiconductive material has the composition $B_aAl_bGa_cIn_dN_eP_fAs_gSb_h$, wherein each of subscripts, *a, b, c, d, e, f, g, h* ranges from 0 to 1, and $a+b+c+d=1$, and $e+f+g+h=1$. The amphoteric conductivity modifier is silicon or germanium, and the addition of the amphoteric modifier to the solution shortly before the deposition of the epitaxial layer is especially efficacious. Also described is the fabrication of an improved electroluminescent diode from a sub-class of the mixed III–V compound materials comprising two members of the group consisting of boron, aluminum, gallium and indium, and one member of the group consisting of nitrogen, phosphorus, arsenic and antimony.

3,560,276

TECHNIQUE FOR FABRICATION OF MULTILAYERED SEMICONDUCTOR STRUCTURE

Morton B. Panish, Springfield, and Stanley Sumski, New Providence, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J., a corporation of New York

Filed Dec. 23, 1968, Ser. No. 786,226
Int. Cl. H01l 7/38
U.S. Cl. 148—171 4 Claims



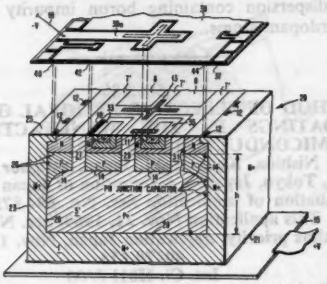
A solution epitaxy technique is employed for the growth of a multilayered structure including a pair of semiconductive regions having different bandgaps with a p-n junction located in the narrow bandgap region. Structures so grown manifest lasing action at higher temperatures and lower threshold currents per unit cross-section than have been attainable heretofore.

3,560,277

PROCESS FOR MAKING SEMICONDUCTOR BODIES HAVING POWER CONNECTIONS INTERNAL THERETO

Robert H. F. Lloyd, Sunnyvale, and Stanley P. Davis, Cupertino, Calif., and Charles Frank Myers, Scottsdale, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed Jan. 15, 1968, Ser. No. 697,731
Int. Cl. H01l 7/36
U.S. Cl. 148—175 8 Claims



A process for making semiconductor bodies, said bodies having power connections and decoupling means internal thereto, said connections comprising diffused low resistance semiconductor regions, wherein said process comprises the steps of forming the low resistance regions and the decoupling means by a series of diffusions including controlled out-diffusions.

3,560,278

ALIGNMENT PROCESS FOR FABRICATING SEMICONDUCTOR DEVICES

Arthur E. Sanera, Lubbock, Tex., assignor to Motorola, Inc., Franklin Park, Ill., a corporation of Illinois

Filed Nov. 29, 1968, Ser. No. 779,967
Int. Cl. H01l 7/44
U.S. Cl. 148—187 12 Claims

Disclosed is a process for fabricating semiconductor devices such as field-effect and bipolar transistors. A mask is formed on the surface of a semiconductor body and the semiconductor body is initially etched at three selected areas to expose three surface areas of the body. These areas define the locations through which impurity diffusions are made later in the process to form first, second and third regions within the semiconductor body. Next the first, second and third exposed areas of the body are recovered with a thin coating which serves as a diffusion mask to protect the second and third areas. Then the first area is reexposed by controlled etching in preparation for a first diffusion step in which an impurity is diffused through the first surface area to form a first active semiconductor device region within the body. Thereafter, the first surface area is covered by a mask while the thin coating is removed from the second and third surface areas to permit the subsequent diffusion of an impurity through these surface areas to form second and third active semiconductor device regions, respectively. Since the first, second and third surface areas were defined initially by the same masking and etching steps, the distance between the first and second regions is equal to the distance between the first and third regions. This precisely con-

trolled spacing between the above device regions enables semiconductor devices to be fabricated with selected electrical characteristics.

3,560,279
METHOD OF DOPING SEMICONDUCTOR MATERIAL

Janos Havas, Wappingers Falls, N.Y., assignor to The National Cash Register Company, Dayton, Ohio, a corporation of Maryland

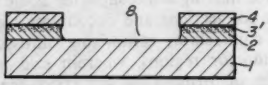
Filed Nov. 5, 1968, Ser. No. 773,410
Int. Cl. H01l *7/34*
U.S. Cl. 148—188 **6 Claims**

The present invention relates to a method of forming a p-n junction in a semiconductor material wherein the region on one side of said p-n junction has a desired low dopant concentration and wherein said region is formed by doping said semiconductor material from a silicon dioxide layer made from a colloidal silicon dioxide-liquid-dispersion containing boron impurity atoms and counterdopant atoms.

3,560,280
METHOD OF SELECTIVE REMOVAL OF OXIDE COATINGS IN THE MANUFACTURE OF SEMICONDUCTOR DEVICES

Sumio Nishida, Kodaira-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan, a corporation of Japan

Continuation of application Ser. No. 594,875, Nov. 16, 1966. This application Nov. 21, 1969, Ser. No. 872,448
Claims priority, application Japan, Nov. 17, 1965, 40/70,273
Int. Cl. H01l *7/00*
U.S. Cl. 156—17 **16 Claims**

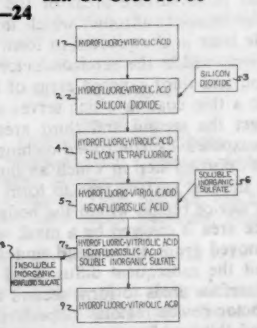


An oxide film formed on a semiconductor substrate is selectively etched by diffusing a metal such as aluminum or chromium into the oxide film prior to etching the film. The diffused metal hardens the oxide film and prevents excessive side etching. Other metals such as, for example, zirconium zinc, titanium, molybdenum, rhodium, gold, niobium, calcium, magnesium and barium and the oxides of these metals may be employed.

3,560,281
PROCESS FOR REGENERATING AN ACID BATH

Cecil R. Nelson, Ashville, Ohio, assignor to Owens-Illinois, Inc., a corporation of Ohio

Filed Oct. 2, 1967, Ser. No. 672,027
Int. Cl. C03c *15/00*
U.S. Cl. 156—24 **6 Claims**



A process for regenerating a glass treating acid bath containing a mixture of hydrofluoric acid and sulfuric acid by adding to said bath an aqueous soluble inorganic sulfate salt to precipitate a glass reaction product and to regenerate the bath.

3,560,282
PROTECTIVE TUBE FOR ELECTRICAL ELEMENTS AND ITS METHOD OF MANUFACTURE

Norman H. Stark, 8810 Bonniwell Road, Mequon, Wis. 53092

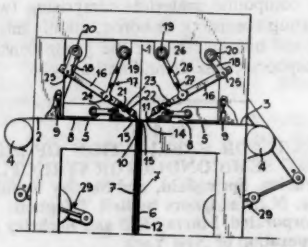
Filed Dec. 14, 1967, Ser. No. 690,566
Int. Cl. C04b *31/06*
U.S. Cl. 156—69 **4 Claims**

Disclosed herein is a protective tube for a thermocouple comprising a non-metallic mat of high temperature resistant material rolled to form a tube with the mat impregnated with a sulfate binder solution and coated with a thermo insulating material. A supporting conduit may be used to provide physical support for the rolled mat.

3,560,283
PROCESS FOR EFFECTING THERMAL SEALING OF STORAGE CELL CASINGS AND LIDS

Jean-Paul Gomis, Pavillons-sous-Bois, and René Chassoux, Talence, France, assignors to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme), Romainville, Seine-Saint-Denis, France, a company of France

Filed Feb. 24, 1969, Ser. No. 801,355
Claims priority, application France, Feb. 29, 1968, 141,783
Int. Cl. B29c *27/00;* B65b *7/00;* H01m *1/02*
U.S. Cl. 156—69 **8 Claims**

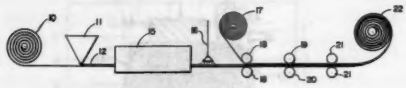


Thermal sealing of thermoplastic storage cell casings and lids is effected by uniform heating by a single heating means to melt temperature of mating edges of the casing and lid and then applying uniform pressure to the molten plastic edges to join them while reinforcing the casing in the vicinity of its edges. Internal and external beads are formed at the joint and the external bead may be removed to form a smooth unbroken line at the joined casing and lid. The apparatus includes a single heating device movable into uniform distances from aligned edges of the casing and lid to heat such edges uniformly to melt temperature and removable thereafter to permit the melted edges to be brought together and joined and also includes reinforcement means for the casing edges as well as means for moving the molten edges in aligned condition together to effect their union, and subsequent trimming off of the external bead formed at the joint.

3,560,284
METHOD OF MAKING FOAM-BACKED TUFTED CARPET

Reuben Wisotzky, Lexington, and Richard E. Petersen, Concord, Mass., assignors to Pandel, Inc., Lowell, Mass., a corporation of Massachusetts

Filed Dec. 4, 1967, Ser. No. 687,608
Int. Cl. D05c *15/03*
U.S. Cl. 156—72 **19 Claims**

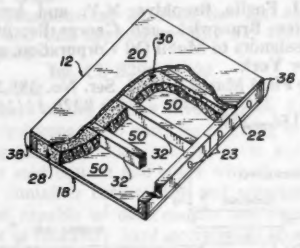


Tufted rugs and carpeting having a thermoplastic backing, e.g. a closed cell foam backing, are prepared by applying a heat-sensitive plastisol composition to the back of a material composed of tufted yarns in a thermoplastic base fabric, fusing the plastisol composition to bind the base fabric and tufted yarns together, and then laminating the thermoplastic sheet to the plastisol layer using the plastisol layer as the sole source of a sensible heat to melt the thermoplastic sheet and bond it to the plastisol layer.

3,560,285
PROCESSES FOR PRODUCING COMPOSITE PANELS

Richard C. Schroter, Orinda, David G. Berg, Oakland, and William A. Schuerman, Jr., Pleasant Hill, Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif., a corporation of Delaware

Filed Feb. 6, 1967, Ser. No. 614,070
Int. Cl. B32b *5/18*
U.S. Cl. 156—79 **16 Claims**

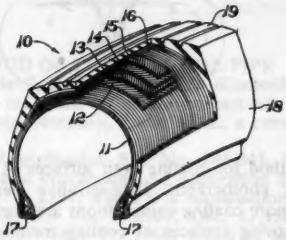


Processes for producing substantially distortion free composite panels made up of one or more outer relatively thin metal facings, edge stiffeners, glue lines having delayed setting up characteristics interposed between and having an affinity for the stiffeners and the outer metal facing or facings and a foamable core or backing material and the products produced thereby. During the processes of producing composite panels wherein a panel assemblage comprised of a stiffener, a glue line of the type described and a facing is subjected to thermal cycling involving elevated temperatures, the glue line initially exhibits sufficient tackiness and strength for floatingly and sealably bonding a stiffener to a metal facing while still permitting the facing to freely expand and contract relative to the stiffener without being dislodged therefrom and while still maintaining an effective sealed relationship therewith. The elevated temperature conditions occur during application and curing of the foamable core or backing material in situ against or between one or more facings. It is only after discontinuance of the thermal cycling that the glue line is allowed to finally set at normal room temperatures and all the elements of the composite panel are allowed to become fully integrated one with another. By the improved use of a glue line having delayed setting up characteristics wherein the final setting up and curing of the glue line does not occur until after thermal cycling has been discontinued, the introduction of wrinkles, buckles, and distortions in a metal facing or facings in the final product is inhibited and a facially attractive product is produced.

3,560,286
METHOD OF MAKING A RADIAL TIRE IN FLAT-BAND FORM

James Sidles, West Richfield, Dennis P. Skala, Akron, and Leonard Skolnik, Cleveland, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y., a corporation of New York

Filed Mar. 15, 1968, Ser. No. 713,373
Int. Cl. B29h *17/26*
U.S. Cl. 156—132 **5 Claims**

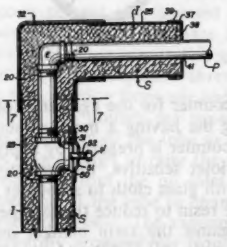


A pneumatic tire comprising a carcass of radially disposed plies of inextensible reinforcing cords, surmounted by a restricting band of circumferentially disposed plies of reinforcing cords of predetermined stretchability intermediate the radially disposed plies, and the method of making such a tire in flat-band form on a conventional building drum.

3,560,287
METHOD AND APPARATUS FOR PROTECTING INSULATED PIPE

Robert W. Helling, Greeley, Colo., assignor to Lundvall and Associates, Greeley, Colo., a partnership

Filed Apr. 27, 1967, Ser. No. 634,347
Int. Cl. B29d *23/10*
U.S. Cl. 156—218 **7 Claims**



A method for ensheating an insulated pipe with a rectangular smooth-surfaced, resin sheet having the characteristics of high-impact polystyrene with a thickness in the range of 0.030 to 0.060 inch by welding the overlapping edges with a fluid cement having therein a solvent of the resin. The sheet is permanently curled to a radius

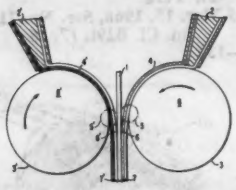
which will snugly embrace a range of sizes of pipe insulation and wrapped about the pipe so as to lap the longitudinal edges of the sheet as the wrap is completed.

3,560,288

METHOD OF MAKING A LAMINATED PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

Takeshi Mikami, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 28, 1967, Ser. No. 694,180
Claims priority, application Japan, Dec. 28, 1966, 42/438
Int. Cl. B29c *23/00*
U.S. Cl. 156—229 6 Claims



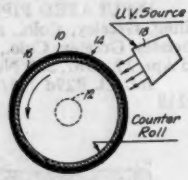
A method for coating both surfaces of a support suitable for photographic light-sensitive elements whereby one or more coating compositions are applied to continuously moving surfaces of cooling members, gelling said coatings by cooling, stripping the gelled layers from the cooling surfaces and adhering them to the surfaces of the support.

3,560,289

ROTARY EMBOSSING DIE COUNTER

Stanley W. Otto, Kansas City, Mo., and Seth W. Warrell, Shawnee Mission, Kans., assignors to Hallmark Cards, Incorporated, Kansas City, Mo., a corporation of Missouri

Filed Feb. 21, 1968, Ser. No. 707,199
Int. Cl. B31f *1/00*
U.S. Cl. 156—219 12 Claims



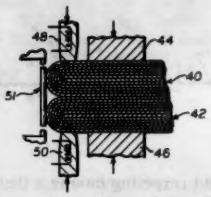
A rotary counter for use against a rotary embossing or foil stamping die having a modeled surface presenting a design. The counter is prepared by applying several layers of an ultraviolet sensitive, thermosetting synthetic resin reinforced with glass cloth to a counter roll. After partial curing of the resin to reduce the tackiness thereof, the die is rotated against the resin blanket on the counter roll to cause the outer face of the blanket to assume a shape which is the reverse of the die. A sheet of lead foil is inserted between the die and the deformed resin to provide paper clearance. Rotation of the die against the lead foil causes the latter to be deformed and the synthetic resin to assume the configuration of the adjacent face of the foil. Final cure of the resin on the counter roll is effected by application of ultraviolet energy to the resin during rotation of the counter roll.

3,560,290

BOOKBINDING WITH WELDED PAGES

Mortimer S. Sendor, 80—30 221st St., Queens Village, New York 11429, and Bernard T. Sendor, 608 Blair Drive, Westbury, New York 11590

Filed Feb. 14, 1969, Ser. No. 799,373
Int. Cl. B31f *1/00*
U.S. Cl. 156—227 16 Claims



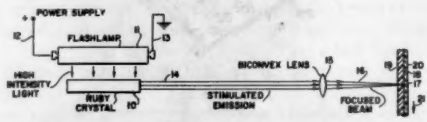
This specification discloses methods of binding books without the use of adhesive, staples, sewing, mechanical, looseleaf binders or other means for holding the pages of the book together. Instead of using the expedients of the prior art, this invention uses leaves made from sheets of paper that can be welded together, the composition of the sheet being uniform throughout its entire area since when the sheet is made, no one knows what parts of its area will eventually be the edge portions of a book made from the sheet. Applications of concentrated energy applied to clamped-together leaves cause them to weld to one another to produce connections that compare favorably with the conventional binding mentioned above.

3,560,291

BONDING THERMOPLASTIC RESIN FILMS BY MEANS OF RADIATION FROM A LASER SOURCE

Andrew J. Foglia, Brooklyn, N.Y., and Arnold F. Stancell, New Brunswick, and George Brecht, Metuchen, N.J., assignors to Mobil Oil Corporation, a corporation of New York

Filed Mar. 27, 1964, Ser. No. 355,215
Int. Cl. B29c *27/04;* B32b *31/26*
U.S. Cl. 156—229 2 Claims



A method for bonding two structures of thermoplastic material which comprises bringing the structures together so that they are in mating contact, and subsequently irradiating the pressed together thermoplastic structures by placing the same in the path of high energy electromagnetic radiation, such as a pulsed laser beam for example, to effect softening of the interface whereby said structures are bonded together.

3,560,292

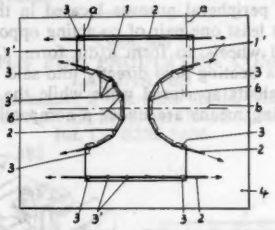
PROCESS FOR FASTENING ELASTIC BANDS TO TEXTILES

Otto Butter, Marktoberdorf, Germany, assignor to Firma X. Fendt & Co., Marktoberdorf, Germany

Filed Mar. 4, 1968, Ser. No. 710,228
Claims priority, application Germany, Mar. 4, 1967, F 51,722
Int. Cl. B32b *31/00*
U.S. Cl. 156—229 14 Claims

Process for fastening a tensioned elastic band to a textile sheet by fusion bonds or welds at least at the ends

of the band and preferably at uniformly spaced spots throughout the entire extent of the band. The band or textile sheet may be provided with a thermoplastic synthetic material to improve the fusion bonding or welding. The fusion bonding may provide the only connection of the band with the textile sheet and overlapping sections



of the textile sheet may be bonded together with the band ends therebetween to form a garment or the like with a closed loop. An edge portion of the sheet may be provided with inwardly extending notches having therein pins on a curved path holding the tensioned band in the curved path prior to the fusion bonding.

3,560,293

METHOD OF MAKING A CONTAINER WITH A PROTECTIVE KICK STRIP

Herbert M. Piker, Wyoming, Ohio, assignor to The Hamilton-Skotch Corporation, Hamilton, Ohio, a corporation of Ohio

Original application June 23, 1965, Ser. No. 466,230. Divided and this application May 31, 1968, Ser. No. 733,678

Int. Cl. B29g *24/00*

U.S. Cl. 156—245 **7 Claims**

The containers of the present invention are formed of expansible polystyrene foam particles resulting in the containers having relatively thick bottom, cover and spacing walls between said bottom and cover with the outer surfaces of said container bottom, top and separating walls quite soft and capable of deformation and bruises. The application of a relatively hard polystyrene sheet to the chest bottom and for a distance upwardly of said bottom to act as a kick-strip and thereby prevent damage to the chest bottom outer surface and walls outer surface upwardly from the bottom. The adherence of a similar hard polystyrene sheet to the outer surface of the cover avoids damage to the cover top surface and depending walls outer surface.

3,560,294

METHOD AND APPARATUS FOR COMBINING A VISCOUS RESIN AND GLASS FIBER STRANDS

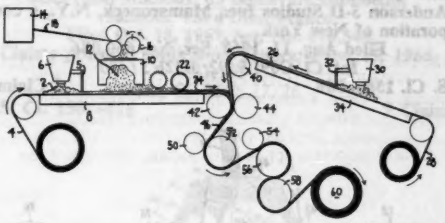
Edward J. Potkanowicz, Apollo, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa., a corporation of Pennsylvania

Filed Aug. 29, 1967, Ser. No. 664,094

Int. Cl. B32b *31/12*

U.S. Cl. 156—276 **6 Claims**

A method and apparatus for combining a viscous resin and reinforcing glass fiber strands. The resin is doctored onto a polyethylene film and chopped glass fiber strands are deposited on the resin. Another polyethylene film containing a layer of resin is rolled onto the glass fiber strands to form a composite laminate and the laminate is pressed together. The laminate is then flexed alternately under pressure into convex and concave arcuate shapes to cause



the viscous resin to thoroughly impregnate the chopped strands.

3,560,295

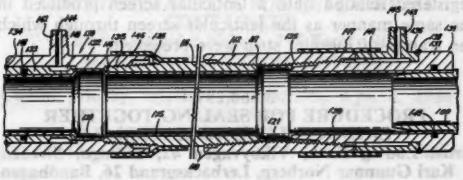
METHOD OF LINING METAL PIPE

Willard B. Kimbrell, Wichita, and Sol B. Kimbrell, Great Bend, Kans., assignors, by mesne assignments, to The Bovaird Supply Company, Tulsa, Okla., a corporation of Delaware

Continuation of application Ser. No. 806,041, Mar. 7, 1969, which is a continuation of application Ser. No. 658,433, Aug. 4, 1967, which is a continuation-in-part of applications Ser. No. 414,989, Dec. 1, 1964, and Ser. No. 550,869, May 17, 1966, which in turn is a division of abandoned application Ser. No. 272,262, Apr. 11, 1963. This application Oct. 17, 1969, Ser. No. 867,416

Int. Cl. B29c *17/07;* **B32b** *31/04*

U.S. Cl. 156—287 **3 Claims**

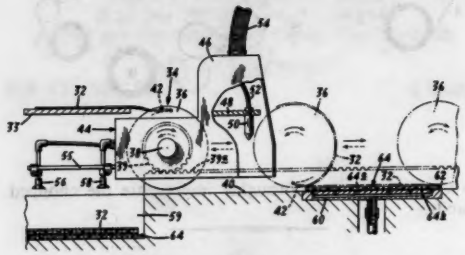


A method of lining metal pipe with a tube of rigid thermal-plastic material having an outer diameter slightly smaller than the inner diameter of the pipe. The tube is coated with an epoxy cement and inserted axially into the pipe. Air is withdrawn from the space between the pipe and the tube to create a vacuum in this space. Hot oil at a temperature of about 285 degrees Fahrenheit is then flowed through the tube starting from one end of the tube at an inlet pressure of 1–5 pounds per square inch and discharging out the other end of the tube to atmospheric pressure for a time long enough to raise the temperature of the tube progressively from the oil inlet end of the tube to the oil outlet end of the tube to change the state of the tube from rigid to plastic. The vacuum causes the tube to expand outwardly progressively from one end of the pipe to the other as it is changed to a plastic state by the oil and the progressive expansion causes residual air to be squeezed out from between the tube and pipe. The vacuum is maintained while the formed tube is cooled, the tube being cemented to the pipe by the epoxy cement. A swab may be pushed through the cooled tube and pipe to further cool the tube and to remove oil adhering to the inside of the tube.

3,560,296
METHOD FOR PREPARING 3-DIMENSIONAL PICTURES

Victor G. Anderson, Rowayton, Conn., assignor to Victor Anderson 3-D Studios Inc., Mamaroneck, N.Y., a corporation of New York

Filed Aug. 11, 1967, Ser. No. 660,086
Int. Cl. C09j 5/02; B32b 31/00
U.S. Cl. 156—308 2 Claims



In the illustrative embodiment of the invention described herein, three dimensional color pictures are prepared by taking a succession of original pictures of an object at different viewing angles with a motion picture camera to provide a film strip. A set of at least three color separation negatives is then made by successively projecting a different primary component of the film strip, frame by frame, onto each of a corresponding number of photosensitive films through a lenticular screen which functions to individualize each frame exposure and, at the same time, causing relative movement between the lenticular screen and the exposed photosensitive film. After the photosensitive films are developed to provide color separation negatives, combined positive color prints are prepared from the separation negatives by graphic art methods. Thereafter, each color print is laminated in registered relation onto a lenticular screen produced in the same manner as the lenticular screen through which the frames of the film strip were projected.

3,560,297
PROCEDURE FOR SEALING TOGETHER LIGNOCELLULOSIC MATERIALS

Ernst Ludvig Back, Vikbyvagen 42, Lidingo, Sweden; Karl Gunnnar Norberg, Lerbacksgrand 26, Bandhagen, Sweden; and Frans Ingvar Johanson, Trevebovagen 82, Akersberga, Sweden

No Drawing. Filed Mar. 24, 1967, Ser. No. 625,572
Claims priority, application Sweden, Mar. 30, 1966, 4,224
Int. Cl. C09j 5/00
U.S. Cl. 156—306 12 Claims

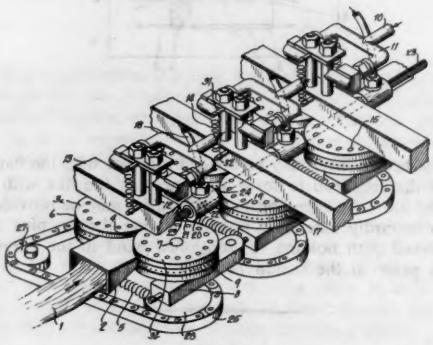
A method for sealing cellulosic and lignocellulosic materials together or to other materials by heating the bonding surfaces of the cellulosic or lignocellulosic materials to at least 250° C. in the absence of added adhesive and maintaining the surfaces at this temperature for a maximum of 30 seconds. The bonding surfaces are then contacted with each other during or immediately after this heating and a pressure is applied.

3,560,298
PAPERLESS CIGARETTE FILTER AND APPARATUS FOR MANUFACTURE THEREOF

Colin Shaw McArthur, Hoyt Sturdivant Beard, and John Raymond Everhart, Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C., a corporation of New Jersey

Filed July 30, 1968, Ser. No. 748,856
Int. Cl. B29j 5/08; D04h 3/12
U.S. Cl. 156—376 4 Claims

An improvement in manufacturing equipment for making paperless cigarette filter rods. A cigarette filter element composed of a compacted bundle of cellulose acetate filaments characterized by a uniform porosity and a smooth surface is obtained by the use of such apparatus. The apparatus comprises: (1) a web gathering means for collecting and directing a web of plasticized filamentary tow into a rod compaction means formed between the surface of a series of oppositely rotating steam injecting wheels, (2) a rod-shaping means formed by the cooperative correspondence of the opposed surfaces of a contiguous pair of peripheral grooves located in the opposing surfaces of at least one pair of co-acting oppositely rotating apertured wheels, to form a die form, (3) a means for injecting a heating fluid directly into said rod-shaping means through its apertured walls while the contents of the rod-shaping means are under a compacting pressure

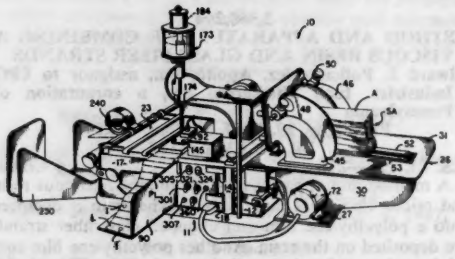


and the rotating wheels are in motion, (4) a means for drying, cooling, and consequently curing the plastic rod-shaped product of the heating and compacting action of the die. The means indicated by (4) may be a second pair or pairs of grooved apertured wheels connected to an air supply or may comprise a cylindrical enclosed plenum chamber containing therein a foraminated central tube through which the rod of heated tow passes. The passage of air into the plenum chamber causes a flow of air to circulate about, cool, and air cure the surface of a filamentary rod passing through the centrally located tube. The cured rod is subsequently severed into measured segments of cigarette filter rod elements having enhanced structural integrity and requiring no paper overwrap during manufacture.

3,560,299
LABELLING MACHINE

Kurt R. Schneider, Bainbridge, N.Y., assignor to Litton Business Systems, Inc., a corporation of New York

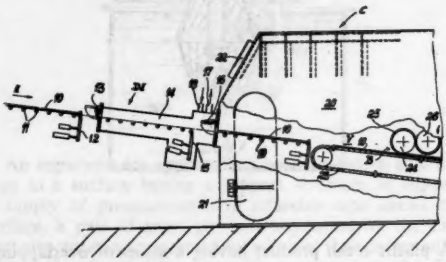
Filed Dec. 24, 1964, Ser. No. 420,912
Int. Cl. B32b 31/12; B65c 1/02, 9/44
U.S. Cl. 156—351 11 Claims



A machine for associating first articles moving along a first path with second articles moving along a second

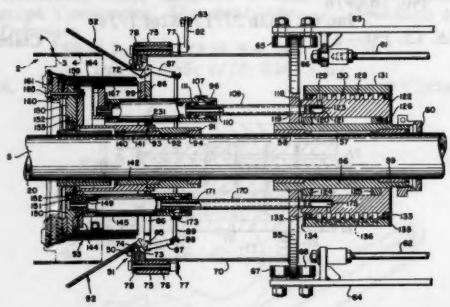
path; the two paths intersecting at a common zone. Drive means are provided for moving the articles along their respective paths under the control of control circuitry and a sensing mechanism responsive to the sensing of indicia disposed on the second articles. The sensing of a first form of indicia arrests the feed of first articles while permitting the feed of second articles while the sensing of a second form of indicia arrests the feed of both first and second articles.

3,560,300
APPARATUS FOR PRODUCING COMPOUND LAMINATES
Ludwig Eigenmann, 2 Via delle Asole, Milan, Italy
Filed Apr. 13, 1966, Ser. No. 542,266
Int. Cl. B29b *1/06*
U.S. Cl. 156—382 **6 Claims**



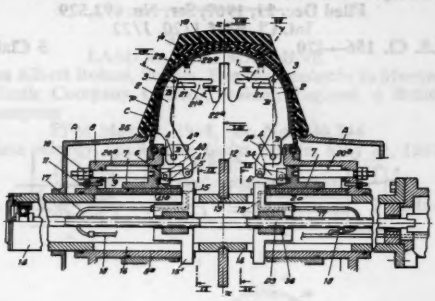
An apparatus for producing compound laminates consisting of a support layer and a hard coating film adhering to one face of the layer, in which a film of hardenable material is spread on a smooth upper face of a rigid planar support and a layer of settable conglomerate material applied to the film after hardening of the latter to form, after settling of the layer, the laminate on the support, whereafter the laminate is separated from the support.

3,560,301
TIRE BUILDING MACHINE
Armindo Cantarutti, Akron, Ohio, assignor, by mesne assignments, to NRM Corporation, a corporation of Ohio
Filed May 29, 1967, Ser. No. 642,067
Int. Cl. B29h *17/12, 17/22, 17/26*
U.S. Cl. 156—401 **27 Claims**



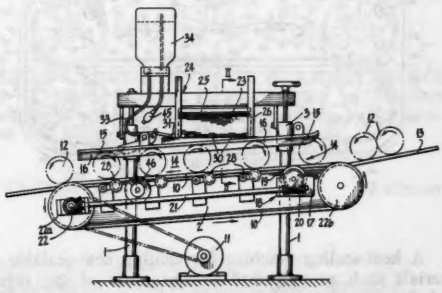
An automatic tire building machine especially suitable for the production of radial tires having a bead setting and dual bag ply turn-up mechanism cooperating with an expansible rotatable drum to place the bead and properly turn the plies thereabout and then to place the side wall material.

3,560,302
SHAPING DRUM FOR THE MANUFACTURE OF TIRE CASINGS
Jean Léon Missioux, 55 Boulevard Gambetta, Sannois, Val d'Oise, France
Filed Oct. 18, 1967, Ser. No. 676,344
Claims priority, application France, Nov. 15, 1966, 83,735
Int. Cl. B29h *17/26*
U.S. Cl. 156—415 **7 Claims**



A machine for shaping a tire casing first in a rough form and then in a finished form. The shaping surface is defined by plural groups of three elements pivotally connected together and pivotally mounted for movement between expanded and retracted positions. In the expanded positions, the groups of elements define an annular surface for supporting a resiliently flexible cover which engages and forms the inner surface of the casing.

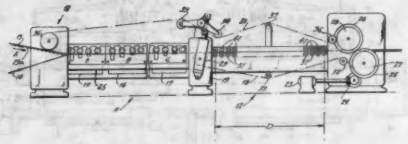
3,560,303
LABELLING MACHINE FOR CYLINDRICAL CONTAINERS
Lloyd Alexander Nelson, 715 Barkly St., West Footscray, Victoria, Australia
Filed Mar. 27, 1967, Ser. No. 626,069
Claims priority, application Australia, Apr. 4, 1966, 3,840/66
Int. Cl. B65c *9/04*
U.S. Cl. 156—453 **4 Claims**



A construction wherein cans rolling down a chute are fed on to a moving conveyor belt and engaged between the conveyor belt and overhead guide rails. The belt is resiliently pressed towards the guide rails so as to reverse the direction of rotation of the cans. A glue dispenser transfers pickup glue to an area of each can circumference as it passes along, and there is a label dispenser

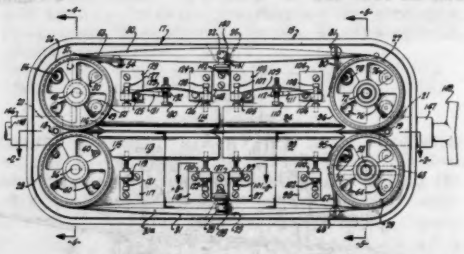
above the guide rails from which a label is picked up by the glue on the can and wrapped around and adhered to the rotating can.

3,560,304
APPARATUS FOR PRODUCING CORRUGATED BOARD
Lawrence J. Saunders, Elmont, N.Y., assignor to S & S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y., a corporation of New York
Filed Dec. 21, 1967, Ser. No. 692,529
Int. Cl. B31f *1/20, 1/22*
U.S. Cl. 156—470 **5 Claims**



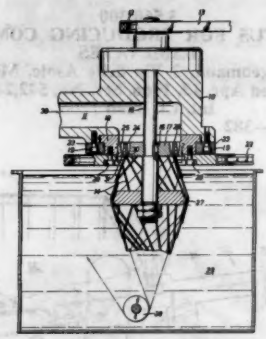
The length of a machine for producing corrugated board is substantially reduced by shortening the pulling section which receives the corrugated board web after it passes through the heating section. Shortening of the pulling section is achieved by constructing and positioning the rollers providing the loading on the upper conveyor belt of the pulling section to have diameters within the range of 1½" to 3" with spacings between centers being 1.1 to 1.3 times roll diameter for steel rollers in the range of 80" to 105" in length.

3,560,305
HEAT-SEALING MACHINE
William W. Hints, Novato, Calif., assignor of one-half to Bette C. Hints, Novato, Calif.
Filed Nov. 21, 1967, Ser. No. 684,681
Int. Cl. B32b *31/20*
U.S. Cl. 156—498 **22 Claims**



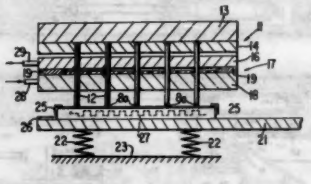
A heat-sealing machine for uniting heat-sealable materials such as polyethylene and other of the thermoplastic materials. The machine constitutes an improvement over those disclosed in Chaffee Pats. No. 2,542,900 and No. 2,542,901 which have a pair of endless belts respectively entrained about pulley wheels therefor which orient and drive the belts so that adjacent surfaces thereof travel in the same direction to grip therebetween and advance the material to be sealed through a sealing station. The improved machine includes twisted metal belts which have a self-cleaning action, and it further includes arrangements for making the belts track properly with the pulley wheels about which they are entrained.

3,560,306
APPARATUS FOR MAKING OVERLAPPING RIBBON MESH
George S. Nalle, Jr., 108 W. 2nd St., Austin, Tex. 78701
Filed Sept. 20, 1968, Ser. No. 761,142
Int. Cl. B29b *1/00*
U.S. Cl. 156—500 **11 Claims**



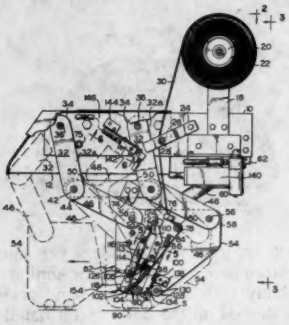
A plastic mesh product having a series of overlapping ribbons is formed by bonding such plastic ribbons with a second set of plastic filaments as the ribbons and filaments extrude from relatively rotating dies. The ribbon-like filaments are extruded from orifices so positioned that only a portion of the width of the ribbon is bonded to the second filaments thus producing a plastic product with overlapping ribbons having a "fish scale" character.

3,560,307
APPARATUS FOR APPLYING SPACING MEANS BETWEEN ELECTRODES OF ELECTRIC POWER SOURCES
Jean Henri Doll, Aulnay sous Bois, and Henri Desire Druesne, La Courneuve, France, assignors to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme), Pont de la Folie, Romainville, France, a French company
Original application Mar. 22, 1966, Ser. No. 536,395. Divided and this application Oct. 22, 1968, Ser. No. 788,976
Int. Cl. B32b *31/12;* **B26f** *1/14*
U.S. Cl. 156—516 **7 Claims**



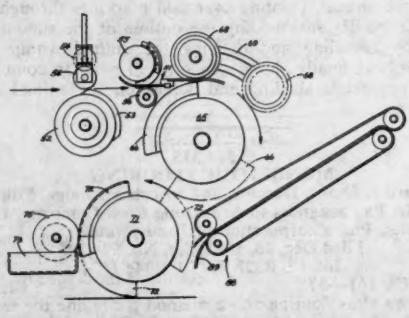
Apparatus for effecting substantially uniform spacing between plates of cells of a battery comprising means for severing individual spacer elements from a spacing sheet and directly adhering the severed elements to an electrode sheet and stacking said sheets with additional electrode sheets, the spacer elements serving to provide the substantially uniform spacing.

3,560,308
TAPE APPLYING APPARATUS
Erville C. Buck, Springfield, Oreg., assignor to The Willamette Valley Company, Eugene, Oreg., a corporation of Oregon
Filed July 24, 1969, Ser. No. 844,506
Int. Cl. B32b *31/04, 31/18*
U.S. Cl. 156—522 7 Claims



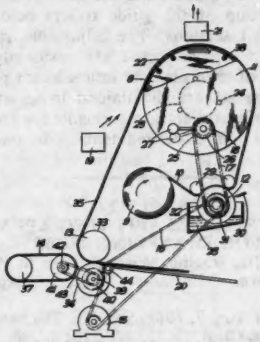
An apparatus for applying a pressure-sensitive adhesive tape to a surface having a support structure to support a supply of pressure-sensitive adhesive tape above the surface, a pair of arms pivotally supported on the support structure and connected by a link at their lower ends, a second pair of arms pivotally connected to the first pair of arms at the lower ends thereof, and a carriage pivotally supported at the lower ends of the second pair of arms and adapted to carry a length of tape from the supply. A pneumatic piston and cylinder lower the carriage to a point at which the length of tape contacts the surface and adheres thereto and then advance the carriage horizontally and apply the tape to the surface. A knife is positioned on said carriage to sever the tape at a point prior to the termination of the horizontal advance of the carriage, and means are provided simultaneously to withdraw a slight excess of tape from the supply and return the carriage to its initial position with the excess tape in position to be applied to the surface during the next cycle of the apparatus.

3,560,309
ADDRESSING AND IMPRINTING MACHINE
John H. Gruver, Cleveland, and Alfred J. Carmont, Willowick, Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio, a corporation of Delaware
Filed June 18, 1968, Ser. No. 737,935
Int. Cl. B65c *9/18;* B26f *3/02*
U.S. Cl. 156—528 10 Claims



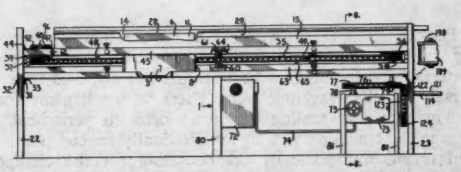
A machine is provided which perforates along a web between columns of information, e.g. addresses, and thereafter cuts a strip off the end of the sheet, taking only one address from each column to produce a strip containing a series of address units connected by perforated areas. Finally, the strip is pulled to burst it progressively, unit-by-unit, into labels or heat transfer printing masters as the case may be, and each unit of information is applied to an item such as a magazine or newspaper moving along a conveyor. The same machine is also capable of adjustment so as to cut and apply units from a single column web.

3,560,310
LAMINATING MACHINE
Brian Albert Bolton, Staines, England, assignor to Morane Plastic Company Limited, Staines, England, a British company
Filed May 20, 1968, Ser. No. 730,244
Claims priority, application Great Britain, May 22, 1967, 23,767/67
Int. Cl. B32b *31/06, 31/12*
U.S. Cl. 156—552 7 Claims



A machine that coats thermoplastic film from a roll with liquid adhesive, passes the coated film over a heated rotary drum having internal stationary heating rods to dry or partly dry the adhesive, the friction between the film and the drum causing the drum to rotate. Web to be laminated is fed by a conveyor belt to a heated roll press which applies the coated film to the web. There are auxiliary drive means to rotate the drum during a warming up period.

3,560,311
METHOD AND MACHINE FOR MAKING TABLETS
Boyd C. Blair, Topeka, Kans., assignor to Brackett Stripping Machine Co., Inc., Topeka, Kans., a corporation of Kansas
Filed Jan. 15, 1968, Ser. No. 697,685
Int. Cl. B42c *13/00*
U.S. Cl. 156—557 7 Claims

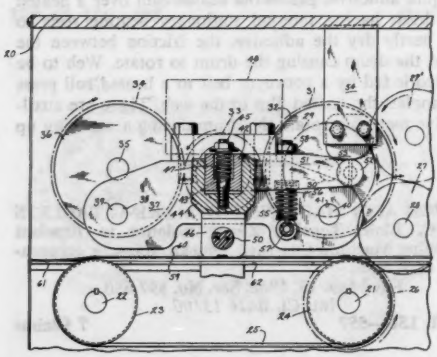


A method and apparatus for making tablets with the method including arranging a plurality of sheets into a set, registering edges of the sheets in the set, holding the set in a pressed together condition, grinding one edge of

the set and applying a hardenable quick drying adhesive to the one edge of the set, said method including maintaining the edges of the set in registry during grinding the one edge and applying adhesive thereto, said method including applying a strip having adhesive to the one edge, folding opposite margins of the strip to engage exterior sheets, and cutting the strip adjacent opposite ends of the one edge.

The apparatus for making the tablets having structure forming a defined path and a pair of cooperating endless belts, each having spaced endless thickened portions on the interior face thereof, means for receiving separate sheets arranged in a set, and means for holding said set between the endless belts and for moving the set along the defined path. The apparatus is adapted to move the set of sheets along the defined path to a grinder adjustable to trim one edge of the set and to an adhesive applying position where a wheel receiving adhesive from a container and applies same to the one edge. The apparatus includes a plurality of spaced guide rollers which are complementary to and adapted to engage the interior face of each endless belt and endless thickened portions thereon with one group of the guide rollers being mounted in adjustable rail sections. The adjustable rail sections are divided into segments and are resiliently mounted whereby the set of sheets is held in a selected position and the sheets in the set are maintained in registry. A plurality of tensioning rollers are associated with each endless belt to maintain a desired tension in the respective endless belts.

3,560,312
ORBITAL PRESSURE APPLYING APPARATUS FOR TRAVELING WEBS
Richard W. Smith, Racine, Wis., assignor to Pratt Manufacturing Corp., Milwaukee, Wis., a corporation of Wisconsin
Filed Aug. 7, 1968, Ser. No. 750,866
Int. Cl. B30b *15/34*; B26c *1/56*
U.S. Cl. 156—583 **10 Claims**

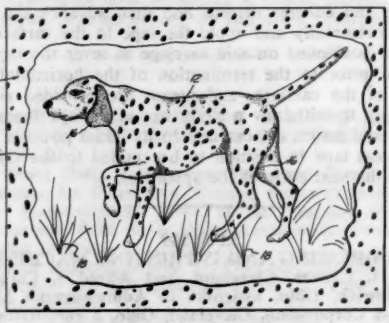


Packaging apparatus with means for continuously moving two superimposed continuous webs of packaging material, and including a heat sealing bar disposed transversely of the traveling web. There is mechanism for moving the heat sealing bar in an orbit to periodically engage the traveling web at longitudinally spaced points, and means automatically compensating for the change in speed of the sealing bar relative to the web due to the harmonic projection of the speed of the orbiting bar on a straight line, whereby said sealing bar, which engages the web for about 30 degrees on each side of center, is caused to travel at the same linear speed as the web during the entire period of engagement.

3,560,313
POM PON
Lawrence R. Herkimer, 11766 Valleydale Drive, Dallas, Tex. 75230
Filed Sept. 17, 1968, Ser. No. 760,228
Int. Cl. D04d *7/06*
U.S. Cl. 16—9 **8 Claims**

A pom pon for use by yell leaders, pep squads, and the like having strands of crepe paper or similar material secured to a body with a protective hand around the portions of the strands on the body and a handle secured to the body for holding the pom pon.

3,560,314
THREE-DIMENSIONAL PAINTED WORKS OF ART
Robert Rodriguez, Westland, Mich., assignor to Handcraft Studio, Inc., Detroit, Mich.
Filed June 27, 1969, Ser. No. 837,157
Int. Cl. B44f *3/00*
U.S. Cl. 161—20 **2 Claims**

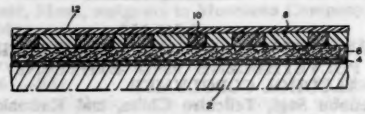


A representation of a selected animal is formed by transferring a silhouette of such animal to a textured simulated animal skin having the appropriate markings for such animal, painting over said markings throughout a wide border surrounding the outline of the silhouette, thereby revealing and defining the animal within the border, and finally applying additional paint to complete the appropriate shading and details on the animal and border.

3,560,315
MONOLITHIC FLOORING
Richard J. Evans, Decatur, and Joseph M. Judge, Millersville, Pa., assignors to Armstrong Cork Company, Lancaster, Pa., a corporation of Pennsylvania
Filed Dec. 28, 1967, Ser. No. 694,295
Int. Cl. B32b *31/10*; E04c *1/24*
U.S. Cl. 161—37 **2 Claims**

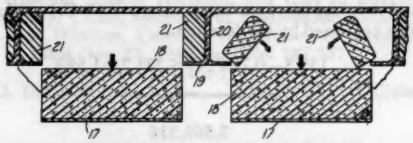
A seamless flooring and a method for laying the seamless flooring. A backing material containing a plurality of chips fastened thereto is fastened to a subfloor. Grouting is placed over the backing in the area between the chips

so that the grou.ing and upper surface of the chips form the upper surface layer of the flooring. A urethane wear-resistant layer is placed over top of the grouting and



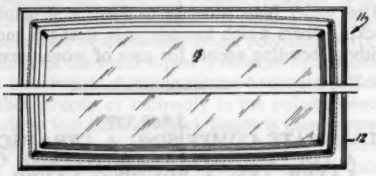
upper surface of the chips. The placing of the grouting over the backing on the job site eliminates the appearance of a seam in the composite floor structure.

3,560,316
LAMINATED FIBER GLASS FLOORING AND METHOD OF MAKING THE SAME
Merwyn C. Gill, Pasadena, Calif. (4076 Easy St., El Monte, Calif. 91731)
Filed Sept. 25, 1967, Ser. No. 670,341
Int. Cl. B32b *1/04*
U.S. Cl. 161—41 **7 Claims**



An integrally formed laminated fiber glass flooring material having a continuous top skin and I-beam stress elements; and a method of making such a structure by molding the resin impregnated glass cloth around a plurality of mandrels and then cutting away the bottom surface of each core element and removing the mandrel therefrom.

3,560,317
LUMINOUS STRETCH PANEL
William C. Nanny, San Francisco, and Russell D. Squire, San Mateo, Calif., assignors to Residential Lighting Sales Company, San Francisco, Calif., a partnership
Continuation of application Ser. No. 544,287, Apr. 21, 1966. This application June 24, 1969, Ser. No. 836,120
Int. Cl. B32b *1/04, 3/02*
U.S. Cl. 161—43 **7 Claims**



An improved panel structure for luminous ceilings in which a thin translucent film is formed about an expanded cellular frame in extension across the opening therethrough and in tension thereupon.

3,560,318
FIBROUS PULP CONTAINING PARTIALLY HYDROLYZED POLYVINYL ACETATE
Walter A. Miller, Somerville, and Ivey Allen, Jr., Neshanic, N.J., assignors to Union Carbide Corporation
No Drawing. Filed Dec. 26, 1967, Ser. No. 693,144
Int. Cl. B32b *5/08, 27/02*
U.S. Cl. 161—82 **8 Claims**

A fibrous pulp comprising oriented fibers of at least three incompatible thermoplastic resins, said fibers having fibrillated surfaces, and one of said thermoplastic resins being a partially hydrolyzed polyvinyl acetate.

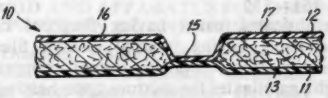
3,560,319
ADHESIVE TAPE
Leo G. Kuhlman, 1109 Audubon Road, Park Hills, Ky. 41011
Filed June 11, 1968, Ser. No. 736,159
Int. Cl. B32b *15/02;* **C09j** *7/04*
U.S. Cl. 161—89 **2 Claims**

This invention discloses an adhesive tape that has a strippable protective backing consisting of a backing layer and a net cloth joined thereto by a pressure sensitive adhesive. The tape is reusable and includes a cloth base coated with adhesive on at least one of its surfaces.

3,560,320
INSULATING MATERIAL
Henry A. Letteron, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Continuation of application Ser. No. 182,968, Mar. 27, 1962. This application Oct. 5, 1967, Ser. No. 673,220
Int. Cl. B32b *5/26, 5/28*
U.S. Cl. 161—93 **3 Claims**

Electrical insulating material is bonded to reinforcing backer material in the preparation of electrical insulating tapes by fused thermoplastic sheet material such as polyethylene, polypropylene, polybutylene, polystyrene, polyvinyl acetate, polyacrylate, cellulose acetate, cellulose acetobutyrate and polyvinyl acetal and blends thereof to provide a porous impregnatable structure.

3,560,321
DECORATED ELECTRONICALLY PROCESSED MATERIALS WITH THE DIE PATTERN EMPHASIZED
Eugene A. Magid, 1610 Cloverly Lane, Rydal, Pa. 19046
Filed Apr. 26, 1965, Ser. No. 450,819
Int. Cl. B32b *3/00, 3/28*
U.S. Cl. 161—119 **2 Claims**



An ornamental plastic sheet structure. A plastic sheet which has a smooth exterior surface of a selected uniform color has a specifically configured pattern portion depressed out of the plane of the remainder of the sheet. The depressed pattern portion may be provided by way of electronic embossing. A decorative coating which is of an appearance and color different from the sheet color covers the sheet remainder only, so as to leave the depressed pattern portion with the initial sheet color exposed through the plane of the remainder of the sheet in a visually prominent manner.

3,560,322
FABRIC-SIMULATING LAMINATED SHEET STRUCTURE AND METHOD FOR MANUFACTURING THE SAME
Eugene A. Magid, Rydal, Pa. 19046
Continuation-in-part of application Ser. No. 383,567, July 20, 1964. This application Jan. 18, 1968, Ser. No. 716,252
Int. Cl. B32b *5/00*
U.S. Cl. 161—120 **1 Claim**

A fabric-simulating, laminated sheet structure and a method for manufacturing the same. The sheet structure

includes at least two layers of thermoplastic sheet material which are coextensively bonded together to form an interface therebetween, with one of these layers having an elasticity which is substantially less than that of the other of the layers so that this one layer forms a carrier layer for the other layer. The other layer is a foam plastic which forms a covering layer for the carrier layer, and the bonded layers are embossed with a multiplicity of registering depressions and projections distributed throughout the layers to provide the foam plastic cover

layer at its exterior surface which is directed away from the one carrier layer with a texturized velvety appearance and feel. These thermoplastic layers are initially at least temporarily bonded to each other at their interface under heat and pressure, and then after preheating the bonded layers are embossed with an engraved embossing roll which provides the multiplicity of depressions and projections distributed throughout the layers, this embossing taking place when the thermoplastic layers have a temperature sufficiently high to retain the registering embossed projections and depressions in the layers.

3,560,323

FIRE-PROOFING OF ELEMENTS PROVIDED WITH CAVITIES CONTAINING A POWDERED INFILL MATERIAL

Charles Emile Zwickert, 108 bis, Rue Jean Jaures, Noisy-le-Sec, Seine-Saint-Denis, France

Filed Dec. 9, 1966, Ser. No. 600,435
Claims priority, application France, Dec. 10, 1965, 41,728; Jan. 11, 1966, 45,459
Int. Cl. E04b *1/94;* **B32b** *3/20;* **C09k** *3/28*
U.S. Cl. 161—139 **9 Claims**

A prefabricated panel having fireproof characteristics, said panel having internal cavities filled with a pulverulent mixture comprising a small proportion of borax which agglutinates the mixture upon heating, thus preventing the flowing of the mixture outside the cavities when the panel is perforated up to the cavities under action of a flame. Preferably, less than 60 grams of finely powdered borax per liter of mixture is thoroughly dispersed in the remainder of the mixture, which is usually a granular sound insulating agent such as sand, asbestos, refractory earth, cement, etc. If desired, the mixture may be partially pre-agglutinated by moderate heating. In addition, a small proportion of borax may be added to any adhesives used in making the panel.

3,560,324

FLEXWOOD LAMINATES COMPRISING A LAYER OF THERMOPLASTIC RESIN-CELLULOSE FIBER PARTICLE MIXTURE AND A LAYER OF CELLULOSIC FIBER

John J. Quackenbush, Monroe, Conn., assignor to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 23, 1966, Ser. No. 596,473
Int. Cl. B32b *21/08*
U.S. Cl. 161—162 **10 Claims**

High strength water resistant laminates are prepared by pressing together one or more sheets of cellulose fiber material and sheets comprising 25% to 75% of a thermoplastic resin and from 75% to 25% of a cellulose fiber filler.

3,560,325

PACKAGING LAMINATE FILM COMPRISING POLYETHYLENE AND ETHYLENE/VINYL ALCOHOL COPOLYMER

Hidenobu Sogi, Teiichiro Chiba, and Katsuaki Hirano, Kurashiki, Japan, assignors to Kurashiki Rayon Co., Ltd., Kurashiki, Japan

No Drawing. Filed June 17, 1968, Ser. No. 737,335
Claims priority, application Japan, June 17, 1967, 42/38,974
Int. Cl. B32b *27/08, 27/30;* **C08j** *1/40*
U.S. Cl. 161—165 **7 Claims**

Laminate film free from tendency of breakage at any boundary portions of heat sealing is prepared by laminating 10–100μ thick film of ethylene/vinyl alcohol copolymer with ethylene content (X) of 20–45 mol percent, saponification of at least 97% and intrinsic viscosity of 0.05–0.20 l./g. on 10–100μ thick polyethylene film and subjecting, before or after the above lamination, the ethylene/vinyl alcohol copolymer film to heat treatment for 1–60 seconds at a temperature (Y° C.) within the range expressed by the formula

$$139.3-0.72X \leqq Y \leqq 221.7-1.59X$$

3,560,326

TEXTILE-LIKE NONWOVEN FABRIC

William Wallar Bunting, Jr., Franklin James Evans, and David Ellis Hook, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Continuation-in-part of applications Ser. No. 712,070, Mar. 11, 1968, and Ser. No. 834,788, June 19, 1969, which are continuations-in-part of applications Ser. No. 584,627, Sept. 22, 1966, and Ser. No. 711,718, Mar. 8, 1968. This application Jan. 29, 1970, Ser. No. 6,964
Int. Cl. D04h *3/08;* **D06c** *1/06*
U.S. Cl. 161—169 **2 Claims**

Nonwoven textile fabrics having closely-spaced parallel regions of fiber entanglement are produced by treating fibrous sheet materials with streams of water or other suitable liquid. A layer of randomly disposed fibers is supported on a smooth surface and fibers are entangled along closely-spaced parallel lines with streams of liquid jetted under high pressure to form a structure of interlocking fibers which has adequate strength and durability without bonding agents for uses of woven textile fabrics.

3,560,327

LAMINATE COMPRISING A CERAMIC LAYER, A POLYTETRAFLUOROETHYLENE COATING LAYER AND A BONDING LAYER OF LOW THERMAL EXPANSION SOLDER GLASS

Walter H. Mills, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

No Drawing. Original application Dec. 6, 1966, Ser. No. 599,394, now Patent No. 3,503,763, dated Mar. 31, 1970. Divided and this application Sept. 5, 1969, Ser. No. 855,748
Int. Cl. B32b *17/10, 27/06;* **C03c** *5/00*
U.S. Cl. 161—189 **4 Claims**

Devitrifying glass compositions for use as solder glasses or coatings, including about 13–23 wt. percent PbO, 4–11% B_2O_3, 4–6% LiO_2, 14–19% Al_2O_3 and 39–50% SiO_2. A nucleating agent may also be included. When crystallized the compositions have coefficients of thermal expansion in the range of about -5 to $+30\times10^{-7}$/° C., and contain lithia-alumina-silicate crystals (beta spodumene or beta-eucryptite) as the primary type, with no lead silicate or zinc silicate crystals present.

3,560,328

PHENOL-FORMALDEHYDE IMPREGNATED CELLULOSIC SHEETS AND LAMINATES

George J. Anderson, Wilbraham, and Ronald H. Dahms, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed July 25, 1968, Ser. No. 747,433
Int. Cl. B32b *27/08, 27/42*
U.S. Cl. 161—251 10 Claims

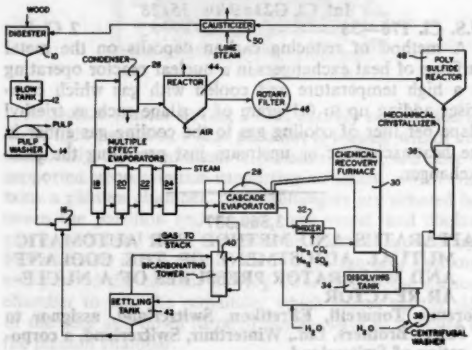
Impregnated cellulosic sheets and laminates which are cold punchable and have good electrical properties. Such constructions are prepared from cellulosic substrates impregnated with a mixture of carboxylated alkadiene interpolymer and a low molecular weight phenol-formaldehyde resin and then overtreated with a certain higher molecular weight substituted phenol-formaldehyde resin. Laminates are made from the resulting sheet-like members by first advancing same and then laying up and thermosetting under heat and pressure.

3,560,329

PROCESS FOR LOW SULFIDE CHEMICAL RECOVERY

Hugh Wharton Nelson, Hartford, and Carl R. Bozzuto, Waterbury, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn., a corporation of Delaware

Filed Dec. 27, 1968, Ser. No. 787,347
Int. Cl. D21c *11/12*
U.S. Cl. 162—30 7 Claims



A paper pulping and chemical recovery process is described which is particularly adapted to pulping with high sulfidity liquors such as those used in the polysulfide process. The sulfidity of the black liquor is reduced by reaction with sodium bicarbonate slurry to release hydrogen sulfide for reuse either directly or indirectly in the pulping process. The resulting low sulfidity black liquor is then burned in the normal manner to provide green liquor. Sodium carbonate is crystallized from the green liquor and used to produce the sodium bicarbonate which is reacted with the black liquor. The remaining green liquor is treated in the conventional manner to provide fresh cooking liquor.

3,560,330

MULTISTAGE CELLULOSE PULP BLEACHING WITH CHLORINE AND CHLORINE DIOXIDE

Nils Knut Gabriel Ahlborg, Falun, Sweden, assignor to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

No Drawing. Filed Feb. 3, 1967, Ser. No. 613,733
Claims priority, application Sweden, Feb. 25, 1966, 2,506/66
Int. Cl. D21c *9/12*
U.S. Cl. 162—66 5 Claims

Bleaching cellulose pulp in a multistage process wherein the pulp at low consistency (2.5–3.5%) is bleached with chlorine, then treated with alkali to remove the major portion of the lignon content of the pulp, and thereafter treated with an excess of elemental chlorine at a pulp concentration of not less than 5% and at a temperature of below 35° C. Small amounts of chlorine dioxide (0.5–2 gm./kilo of pulp) may optionally be added to the elemental chlorine in the second chlorine treatment step. Subsequent treatment stages may follow which include alkali washes and chlorine dioxide bleachings.

3,560,331

PULPING OF WOOD WITH SULFITE BASE DIGESTION LIQUOR CONTAINING ACETIC ACID

Andrew Beelik, Shelton, Wash., assignor to ITT Rayonier Incorporated

No Drawing. Filed Mar. 4, 1968, Ser. No. 709,891
Int. Cl. D21d *3/00*
U.S. Cl. 162—76 3 Claims

A high-grade sulfite wood pulp of substantially increased bleachability and intrinsic viscosity is produced by digesting wood in a conventional manner with a soluble-base sulfite digestion liquor in which from about 20 to 75 percent of the water, by volume, has been replaced with acetic acid.

3,560,332

PAPER MOLDPROOFED WITH DI(PHENYLMERCURIC)-AMMONIUM SALTS OF ALIPHATIC CARBOXYLIC ACIDS

Henry C. Crandall and Alan R. Bowers, Mosinee, Wis., assignors to Mosinee Paper Mills Company, Mosinee, Wis., a corporation of Wisconsin

Filed Sept. 8, 1965, Ser. No. 485,843
Int. Cl. D21d *3/00;* D21h *5/22*
U.S. Cl. 162—161 3 Claims

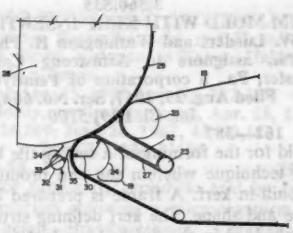
Moldproof paper produced by adding water-soluble di(phenylmercuric)-ammonium salts of alpihatic carboxylic acids to a partially or fully dried web of paper.

3,560,333

METHOD AND APPARATUS FOR DRYING PAPER ON A YANKEE DRYER

Dean C. Douglas, Wallingford, Richard L. Elderkin, Media, and Donald F. Pohlman, Springfield, Pa., assignors to Scott Paper Company, Delaware County, Pa., a corporation of Pennsylvania

Filed Aug. 15, 1967, Ser. No. 660,644
Int. Cl. D21f *11/00*
U.S. Cl. 162—206 19 Claims



Papermaking apparatus is disclosed which includes steam supply means adapted to apply steam to the surface of a wet paper web to be dried in the region immediately preceding the point where the paper web contacts

the surface of the Yankee dryer. One embodiment of the method and apparatus disclosed involves contacting a wet paper web with steam immediately before it passes into the on-running side of a drying nip formed by a pressure roll in contact with the Yankee dryer. Embodiments of the method and apparatus are disclosed in which the above feature is utilized in conjunction with suction pressure rolls, and solid rolls, such as blind drilled rolls and grooved rolls. A further embodiment is disclosed in which steam is also applied to the exposed surface of a wet paper web carried on a Yankee dryer between two successive pressure rolls. One disclosed form of this embodiment involves the use of a hood between the paper web and the felt loop running from one pressure roll, around a guide roll and to a successive pressure roll. Another disclosed form of this embodiment involves enclosing the ends of the space defined by the felt loop and the surface of the Yankee dryer and the insertion of steam into that space to elevate the vapor pressure inside the space at least to the vapor pressure of the wet paper web carried on the Yankee dryer and, preferably, substantially to atmospheric pressure.

3,560,334

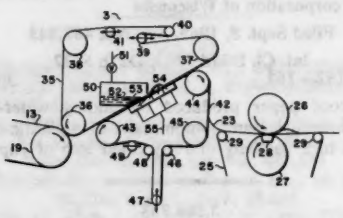
APPARATUS FOR INCORPORATING ADDITIVE DISPERSIONS TO WET WEBS OF PAPER

Hanns F. Arledter, Chillichothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio, a corporation of Ohio

Continuation of application Ser. No. 490,453, Sept. 27, 1965. This application Jan. 27, 1969, Ser. No. 797,357

Int. Cl. D21h *3/00*

U.S. Cl. 162—266 **2 Claims**



An uphill applicator apparatus for incorporating additives to wet webs of paper. The apparatus has particular utility for incorporation of dispersed additives to wet paper webs containing pre-applied flocculent materials, and comprises supporting foraminous wires, additives dispensing head box means and vacuum means for controlling the extent of penetration of the additive dispersion into the paper web.

3,560,335

VACUUM MOLD WITH KERF INSERTION SYSTEM

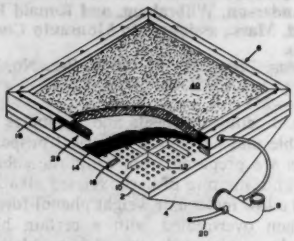
Robert W. Lueders and Washington H. Phillips, Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa., a corporation of Pennsylvania

Filed Aug. 29, 1967, Ser. No. 664,090

Int. Cl. B29j *5/00*

U.S. Cl. 162—387 **1 Claim**

A mold for the forming of a ceiling tile by the vacuum molding technique wherein the end product is provided with a built-in kerf. A frame is prepared having the desired size and shape. The kerf defining structure which is to be embedded in the finished product to form the kerf is placed around the edge of the frame. The frame is then immersed in a tank containing a liquid pulp slurry. A vacuum pulls on one side of a screen resulting in a buildup of wet pulp fibers on the reverse side of the screen. A peripheral vacuum means assists in the formation of the peripheral edges of the ceiling tile. The kerf defining structure is releasably held against the peripheral edge vacuum means by a removable perforated Z-shaped



support element. The pulp fibers build up around the kerf defining structure and actually result in the kerf defining structure being embedded in the finished product.

3,560,336

PROCESS FOR THE PREVENTION OR REDUCTION OF CARBON DEPOSITS ON METAL SURFACES IN A NUCLEAR REACTOR

Walter Karcher, Alkmaar, Netherlands, assignor to European Atomic Energy Community (Euratom), Brussels, Belgium

No Drawing. Filed Feb. 12, 1968, Ser. No. 704,526

Claims priority, application Netherlands, Mar. 19, 1967, 6703688

Int. Cl. G21c *9/00, 15/28*

U.S. Cl. 176—38 **2 Claims**

A method of reducing carbon deposits on the metal surfaces of heat exchangers in a nuclear reactor operating at a high temperature and cooled with gas which comprises adding up to 0.1 gram of a silane such as triethyl silane per liter of cooling gas to the cooling gas either in the heat-exchanger or upstream just preceding the heat-exchanger.

3,560,337

APPARATUS AND METHOD FOR AUTOMATIC MUTUAL ADJUSTMENT OF THE COOLANT AND MODERATOR PRESSURES OF A NUCLEAR REACTOR

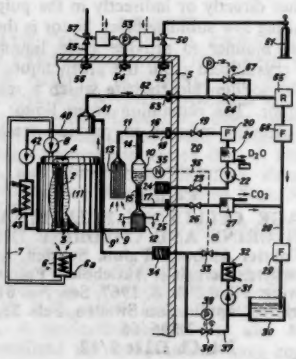
Lorenzo Tonarelli, Effretikon, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland, a corporation of Switzerland

Filed Dec. 8, 1967, Ser. No. 689,125

Claims priority, application Switzerland, Oct. 26, 1967, 17,920/66

Int. Cl. G21c *15/00*

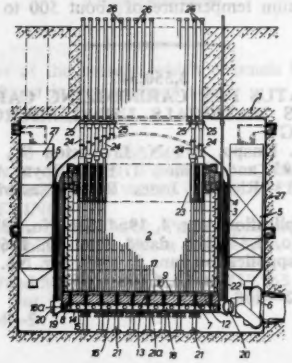
U.S. Cl. 176—52 **13 Claims**



A levelling vessel is disposed outside the moderator vessel and is connected to both the moderator circuit in the moderator vessel and to at least one point in the

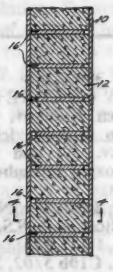
coolant gas circuit. The pressures of the coolant and moderator are compared within the levelling vessel without using any other barrier medium. Branch pipes are provided off the lines to the levelling vessel to permit purification and return of the coolant and moderator to their respective circuits.

3,560,338
GAS-COOLED NUCLEAR REACTORS
Gordon Brown, Sutton, England, assignor to Atomic Power Constructions Limited, Sutton, Surrey, England, a British company
Filed Feb. 9, 1968, Ser. No. 704,431
Int. Cl. G21c *15/00*
U.S. Cl. 176—59 **11 Claims**



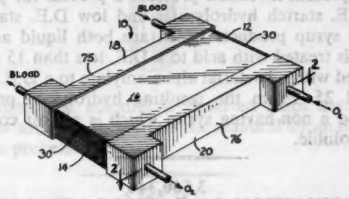
A nuclear reactor having a core entirely surrounded by a gas tight partition, which partition is located within and completely separated from a pressure vessel, the core is supported upon a lattice supporting structure, which contains a plenum chamber, heat exchangers are situated between the partition and the pressure vessel, and coolant gas is circulated from the plenum chamber up through fuel channels in the core down through the heat exchangers, part of the coolant flowing directly into the plenum chamber to join the remainder which passes up the side of the core and down through passageways in the core to the plenum chamber.

3,560,339
FUEL ELEMENTS
William E. McHugh, Rochester, Mich., assignor to Atomic Power Development Associates, Inc., Detroit, Mich., a corporation of New York
Filed May 12, 1967, Ser. No. 637,947
Int. Cl. G21c *3/34*
U.S. Cl. 176—76 **5 Claims**



A nuclear reactor fuel element having an elongated tubular cladding which contains fuel particles and a disc of smaller diameter than the internal diameter of the cladding.

3,560,340
PROCESS FOR TREATING BODY FLUIDS
Ronald Leonard, Elk Grove Village, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill., a corporation of Delaware
Filed Mar. 11, 1968, Ser. No. 712,066
Int. Cl. C12k *9/00*; B01d *13/00*
U.S. Cl. 195—1.8 **6 Claims**



A support member in each of two sets of pockets formed by membranous layers, films fluid to minimize variation in resistance to flow causing short circuits. A pair of channels at the upstream and downstream end portions of at least one set of pockets and defined by the support members minimizes resistance to flow of fluid across the input and output end portions of the pockets of such set.

3,560,341
PROCESS FOR THE REMOVAL OF STRAIGHT CHAIN HYDROCARBONS FROM PETROLEUM FRACTIONS
Alfred Champagnat, Paris, and Jean Antoine Filosa, Lavera, France, assignors to The British Petroleum Company Limited, London, England, a British joint-stock corporation
No Drawing. Continuation of application Ser. No. 330,520, Dec. 16, 1963, which is a continuation-in-part of applications Ser. No. 131,470, Aug. 15, 1961, now Patent No. 3,193,390, and Ser. No. 228,728, Oct. 5, 1962. This application Aug. 15, 1968, Ser. No. 755,019
The portion of the term of the patent subsequent to June 21, 1983, has been disclaimed
Int. Cl. C12c *11/00*; C12d *13/06*; A23j *1/18*
U.S. Cl. 195—3 **10 Claims**

A process for the production of an edible yeast product with a concurrent dewaxing of a petroleum fraction containing initially from 3 to 45% by weight of n-paraffin, said fraction further containing branched-chain paraffins, naphthenes and aromatics. Said process produces a dewaxed gas-oil product thus rendered more suitable for industrial use through a reduced proportion of n-paraffin and an edible yeast product which is cultivated at the expense of the n-paraffin initially present.

3,560,342
PROCESS FOR PRODUCING OROTIDYLIC ACID
Kiyoshi Nakayama, Sagamihara-shi, and Haruo Tanaka, Machida-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan
Filed Apr. 15, 1968, Ser. No. 721,189
Claims priority, application Japan, Apr. 18, 1967, 42/24,209; June 24, 1967, 42/40,141
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 **19 Claims**

A process for producing orotidylic acid by fermentation which comprises culturing a microorganism belonging to the genus Brevibacterium, Corynebacterium, Arthrobacter or Micrococus in an aqueous nutrient medium and adding to the medium, either prior to the initiation of culturing or during culturing, 6-azauracil, 5-hydroxyuracil, ribosides or ribotides of these compounds, or mixtures thereof. Orotic acid or arotidine may also be added to the medium.

3,560,343

LOW D.E. STARCH CONVERSION PRODUCTS

Frederick C. Armbruster, La Grange, and Clarence F. Harjes, Hinsdale, Ill., assignors to CPC International Inc., New York, N.Y., a corporation of Delaware

No Drawing. Filed Mar. 24, 1967, Ser. No. 625,584
Int. Cl. C12d *13/02*
U.S. Cl. 195—31 9 Claims

The present invention provides a process for preparing low D.E. startch hydrolysates and low D.E. starch conversion syrup products which are both liquid and solid. Starch is treated with acid to a D.E. less than 15 and then conveted with a bacterial alpha-amylase to a D.E. between 10 and 25. From the resulting hydrolysate product is obtained a non-having syrup which is almost completely water-soluble.

3,560,344

REDUCTION OF GASEOUS NITROGEN TO AMMONIA

William A. Bulen, Enon, Ohio, assignor to Charles F. Kettering Foundation, Yellow Springs, Ohio, a corporation of Ohio

No Drawing. Continuation-in-part of application Ser. No. 494,947, Oct. 11, 1965, now Patent No. 3,423,289. This application Aug. 29, 1967, Ser. No. 663,982
The portion of the term of the patent subsequent to Jan. 20, 1986, has been disclaimed
Int. Cl. C12d *13/00*
U.S. Cl. 195—50 10 Claims

An organo-metallic catalyst useable in reduction of gaseous nitrogen to ammonia in a system independent of metabolizable carbohydrates and oxygen and requiring 105 Kcal./mole of N_2 gas reduced, based on the free energy of hydrolysis of adenosine triphosphate of 7 Kcal./mole, as well as a method of deriving the catalyst from microorganisms grown in nitrogen are described. The porduction of recoverable ammonia by the chemcial reduction of nitrogen gas using this catalyst, an electron donor and a phosphorylating agent in an aqueous media buffered with zwitterionic materials at a pH in the range of 6 to 8, pH 7.25 being optimum is also described.

3,560,345

PROCESS FOR PRODUCING BACTERIAL ISOAMYLASE

Yasuyuki Yokobayashi, Sakai-shi, Osaka, and Kaname Sugimoto and Yoshinori Sato, Okayama, Japan, assignors to Hayashibara Co., Okayama-shi, Okayama, Japan, a corporation of Japan

No Drawing. Filed May 31, 1968, Ser. No. 733,326
Claims priority, application Japan, June 2, 1967, 42/34,867
Int. Cl. C07g *7/02*
U.S. Cl. 195—66 5 Claims

A culture medium, which contains appropriate sources of carbon and nitrogen and mineral materials, is inoculated with *Pseudomonas amyloderamosa* (ATCC No. 21,262) and the strain is cultured with shaking at about 30° C. After the culture, the culture fluid obtained is centrifuged and cold acetone is added to the supernatant fluid to precipitate isoamylase. The isoamylase precipitated is centrifugally collected and dried in vacuo to yield the isoamylase in powdery form.

3,560,346

PROCESS OF PRODUCING SHAPED COKE

Heitmann Günter, Frankfurt am Main, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany, a corporation of Germany

No Drawing. Continuation-in-part of applications Ser. No. 581,454, Sept. 23, 1966, and Ser. No. 664,597, Aug. 29, 1967. This application Dec. 19, 1969, Ser. No. 886,770
Int. Cl. C10b *53/08*
U.S. Cl. 201—6 29 Claims

Process of producing coke pellets bokies in a rotary kiln comprising feeding to the kiln carbonaceous matter having a high volatilec content, an oxygen containing gas, and cokable pellets comprising a mixture of a substantially non-caking carbonaceous material and a highly coking carbonaceous material; coking the pellets in the rotary kiln; simultaneously burning the volatiles produced in said coking and the volatiles produced from the high volatiles carbonaceous matter to produce substantially all of the heat required to operate the process; and simultaneously producing from the high volatiles containing carbonaceous material the substantially non-caking carbonaceous material which is used in the pellet formation. On an overall basis there is added to the kiln highly caking coal, oxygen and high volatiles containing carbonaceous material.

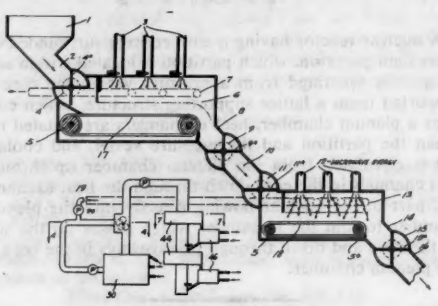
The pellets are heat hardened in the kiln by raising their temperature at a rate of at least 15° C. per minute to a maximum temperature of about 500 to 1,000° C.

3,560,347

APPARATUS FOR CARBONIZING CARBONACEOUS MATERIALS USING MICROWAVE ENERGY

Edward M. Knapp, 951 N. Livingston St., Arlington, Va. 22205, and Weldon T. Ellis, Royal Arms Apts. S–11, 2011 Richard Jones Road, Nashville, Tenn. 37215

Original application Aug. 4, 1964, Ser. No. 387,453, now Patent No. 3,449,213, dated June 10, 1969. Divided and this appplication June 2, 1969, Ser. No. 829,538
Int. Cl. C10b *7/06*
U.S. Cl. 202—108 3 Claims



Coal is first preheated in a first chamber by direct contact with hot gases and is then carbonized in a second chamber using microwave energy as the heat source. The volatile material from the second chamber is fractionally condensed.

3,560,348

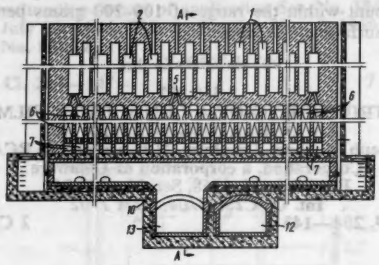
BATTERY OF COKE OVENS

Nikolai Konstantinovich Kulakov, Ulitsa Danilevskogo 14, kv. 21; Solomon Grigorievich Grebshtein, Ulitsa Danilevskogo 14, kv. 39; and Evgeny Nikolaevich Nikitin, Ploschad Rozy Ljuxemburg 5, kv. 28, all of Kharkov, U.S.S.R.

Filed Nov. 8, 1967, Ser. No. 681,384
Claims priority, application U.S.S.R., Dec. 17, 1966, 1,117,023
Int. Cl. C10b *5/02, 5/16*
U.S. Cl. 202—141 3 Claims

A battery of coke ovens comprises a plurality of horizontal coke ovens with hollow firing members on both sides of the ovens; the hollow members are connected to regenerators which in turn are connected to longitudinal

side flues at the feed and discharge sides of the battery. The side flues empty into respective transverse channels



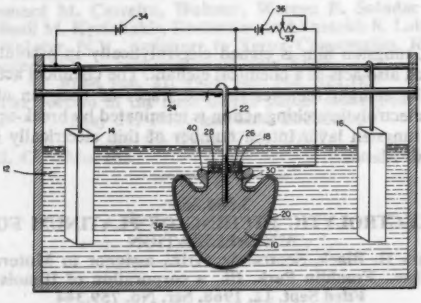
at the center of the battery, which channels lie side-by-side and exhaust into a common stack.

3,560,349

METHOD OF ELECTROFORMING CONTAINERS HAVING OPENINGS WITH THICK SECTIONS AT THE OPENINGS

Michael Mattia, Upper Darby, Pa., assignor to The Budd Company, Philadelphia, Pa., a corporation of Pennsylvania

Filed May 1, 1968, Ser. No. 725,765
Int. Cl. C23b *7/02*; B01k *3/02*
U.S. Cl. 204—9 **4 Claims**



A method of electroforming a container having a thickened section at an opening is provided. A cathodic electrode surface is applied on the entire area of an expendable mandrel except for an area at which an opening is to be provided. The mandrel is then placed in a bath of electrically conductive solution. Separate power sources are applied to a plurality of anodes. One of the anodes is disposed relatively close to the area at which an opening is to be formed thereby providing a relatively thickened portion of electrodeposited material with respect to the material deposited on the main surface of the mandrel.

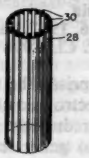
3,560,350

IRREGULAR SHAPED TUBING FORMED BY ELECTRODEPOSITION

Michael Mattia, Upper Darby, Pa., assignor to The Budd Company, Philadelphia, Pa., a corporation of Pennsylvania

Filed Oct. 1, 1968, Ser. No. 764,241
Int. Cl. C23b *7/02*
U.S. Cl. 204—9 **5 Claims**

A method of electroforming tubular articles of irregular shapes is provided. A mold is first cast having a cavity therein corresponding to the particular tubular article to be formed. A flexible mandrel is then formed in the mold correspondingly shaped to the article being



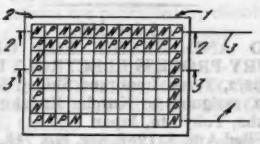
formed. After the mandrel is removed from the mold, the tubular article is formed on the mandrel by an electrodeposition process.

3,560,351

METHOD OF MAKING A THERMOELECTRIC DEVICE

Colin E. Abbott, Windsor, and Bingley J. Wray, Woodley, near Reading, England, assignors to Mining & Chemical Products Limited, London, England, a British company

Filed Aug. 24, 1967, Ser. No. 663,157
Claims priority, application Great Britain, Sept. 2, 1966, 39,225/66
Int. Cl. C23b *5/48, 7/00*
U.S. Cl. 204—15 **4 Claims**



To both major faces of a flat matrix of thermoelements electroplating resist material is applied in a grid-like pattern. The matrix with the resist on its faces is then put in an electroplating bath and constitutes the cathode therein. Metallic electrical connecting links are then formed on the thermoelements by electrodeposition. The commutation of the deposited links is determined by the pattern of the resist material. The commutations of the two faces are different.

3,560,352

METHOD FOR CLEANING METAL SURFACES

Johannes van Garderen, Baarn, and George G. Busch, Bussum, Netherlands, assignors to M&T Chemicals Inc., New York, N.Y.

No Drawing. Filed Sept. 23, 1965, Ser. No. 489,745
Int. Cl. C23b *1/00*; B08b *7/00*; B44d *1/34*
U.S. Cl. 204—32 **3 Claims**

In accordance with certain of its aspects, this invention relates to a process for cleaning pretreated metal surfaces bearing inorganic and organic contaminant consisting essentially of the steps of immersing said pretreated metal surface in water and then immersing said pretreated metal surface in water-immiscible organic solvent to form a non-stable suspension of water in organic solvent thereby obtaining a bright, clean metal surface free of contaminant, and coating said bright, clean metal surface.

3,560,353

ELECTROLYSIS CELL CURRENT EFFICIENCY WITH OXYGEN-CONTAINING GASES

Rudolf E. Svadlenak, Lewiston, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

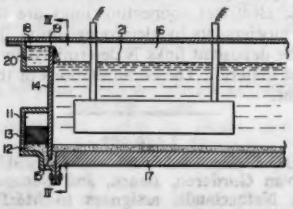
No Drawing. Filed Sept. 26, 1967, Ser. No. 670,799
Int. Cl. C22d *3/06*
U.S. Cl. 204—68 **3 Claims**

A fused salt electrolysis cell bath is treated with an oxygen-containing gas, such as air, wherein the treating is effected outside the electrolysis cell.

3,560,354
ELECTROLYTIC CHEMICAL PROCESS
Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif., a corporation of California
Filed Oct. 16, 1967, Ser. No. 675,534
Int. Cl. C07b 3/00
U.S. Cl. 204—80 10 Claims

The invention comprises the use of a diaphragmless, alternating current electrolytic cell for the conducting of irreversible chemical reductions or oxidations. The electrolytic cell is used to generate an intermediate that is reactive with the reactant to form a chemical product. The reaction is performed in the electrochemical cell under irreversible conditions. In a specific embodiment the reaction is applied to the oxidation of olefins using an electrolyte containing a Group VIII noble metal and sufficient dissolved salts for providing the desired conductivity between the electrodes. The reaction can be performed in aqueous acids, organic carboxylic acids, alcoholic electrolytes, etc., and the product of the oxidation depends upon the choice of this medium. Use of aqueous electrolytes results in the formation of unsaturated carboxylates; and use of alcoholic reaction media results in the formation of acetals and unsaturated ethers. Examples of specific use are the oxidations of ethylene to acetaldehyde and/or vinyl acetate; or dimethyl acetal.

3,560,355
METHOD AND DEVICE FOR OPERATING MERCURY-PROCESS ELECTROLYTIC CELLS
Hiroshi Shibata, Teruo Imai, and Shigeji Kumaki, Iwakishi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed Apr. 3, 1968, Ser. No. 718,438
Claims priority, application Japan, Apr. 19, 1967, 42/24,560; Nov. 24, 1967, 42/75,371
Int. Cl. C01d 1/08
U.S. Cl. 204—99 4 Claims

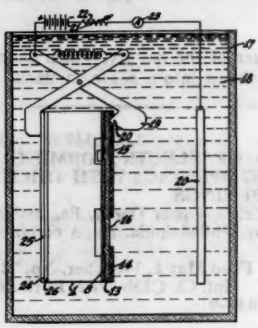


The refined brine recirculated to a mercury-cathode cell is introduced into the cell in the form of a falling laminar-flow curtain along almost the entire inner surface of an inlet transverse wall of the cell above the recovered mercury inlet, the laminar-flow curtain of brine thereby reaching and thoroughly washing the entering mercury to prevent any alkaline wash water flowing above the mercury from reaching the graphite anode. This laminar-flow curtain is formed by a long and narrow brine inlet provided in and extending horizontally across almost the full width of the transverse wall at a position sufficiently high above the surface level of the electrolyte in the cell.

3,560,356
PROCESS OF ELECTROLYTIC PICKLING OF COPPER-BERYLLIUM ALLOYS
Henri Richaud, Chambery, France, assignor to Pechiney-Compagnie de Produits Chimiques et Electrometallurgiques, Paris, France
No Drawing. Filed May 19, 1967, Ser. No. 639,608
Claims priority, application France, June 10, 1966, 64,929
Int. Cl. C23b 1/00
U.S. Cl. 204—141 7 Claims

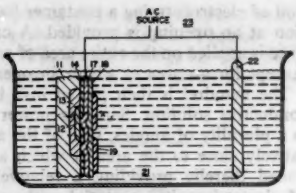
A process for pickling parts formed of copper-beryllium alloy in which small amounts of nickel or cobalt may be present as additional alloying elements, wherein the part to be pickled is connected to the anode in a direct current electrolysis cell in which the electrolyte is an aqueous solution of an alkali metal halide present in an amount within the range of 100–200 grams per liter and a surface active agent.

3,560,357
ELECTROETCHING OF A CONDUCTIVE FILM ON AN INSULATING SUBSTRATE
Joseph M. Shaw, Cranbury, N.J., assignor to RCA Corporation, a corporation of Delaware
Filed July 26, 1968, Ser. No. 747,960
Int. Cl. C23b 3/04; C23f 1/02
U.S. Cl. 204—143 2 Claims



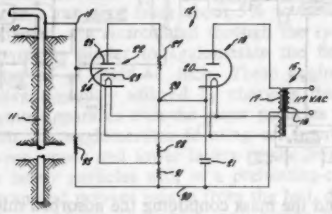
A tungsten film is etched electrolytically in a solution which also acts as a chemical etchant. The chemical action of the etchant removes the last traces of tungsten after the electrolytic etching action is terminated by break-up of the tungsten layer into a number of thin electrically isolated "islands."

3,560,358
ELECTROLYTIC ETCHING OF PLATINUM FOR METALLIZATION
James R. Black, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill., a corporation of Illinois
Filed Sept. 12, 1968, Ser. No. 759,344
Int. Cl. B23p 1/00
U.S. Cl. 204—143 4 Claims



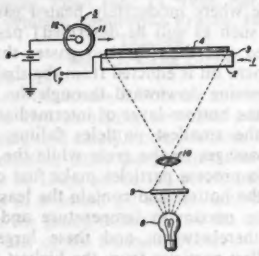
A platinum thin film is patterned by a selective etching process, including the step of depositing the platinum film on a conductive substrate, followed by the application of a photoresist film on the platinum film, patterned in the same image as desired in the platinum. The composite structure is then subjected to alternating current electrolysis in a bath comprising an electrolyte which forms a soluble complex with the platinum. The technique is specifically applied to the fabrication of semiconductor devices with titanium-platinum metallization.

3,560,359
CORROSION PROTECTION
Richard L. Hood, 10333 Dolecetto, Rancho Cordova, Calif. 95670
Continuation-in-part of application Ser. No. 384,376, July 22, 1964. This application May 5, 1969, Ser. No. 825,121
Int. Cl. C23f *13/00*
U.S. Cl. 204—147 7 Claims



A source of free electrons, such as is supplied by the grid of a conducting vacuum tube, is connected by a single electrical conductor to a metallic structure to be protected from corrosion. No return path for electrons from the metallic structure to the source is provided and it is not required that the protected structure be earth grounded.

3,560,360
PHOTOELECTROPHORETIC IMAGING PROCESS USING ANTHRAQUINONES AS THE ELECTRICALLY PHOTOSENSITIVE PARTICLES
Leonard M. Carreira, Webster, Warren E. Solodar and Basil M. Kyriakakis, Rochester, and Santokh S. Labana, Webster, N.Y., assignors to Xerox Corporation, Rochester, N.Y., a corporation of New York
Filed Jan. 21, 1966, Ser. No. 522,187
The portion of the term of the patent subsequent to May 21, 1985, has been disclaimed
Int. Cl. G03g *5/06, 13/22*
U.S. Cl. 204—181 8 Claims



Substituted and unsubstituted anthraquinones are used as electrically photosensitive particles in photoelectrophoretic imaging.

3,560,361
PRODUCTION OF AZACARBAZOLES
Victor Malcolm Clark, Coventry, and Gordon Ian Gregory and John Derek Cocker, Chalfont St. Peter, England, assignors to Glaxo Laboratories Limited
No Drawing. Filed Mar. 28, 1969, Ser. No. 811,646
Claims priority, application Great Britain, Mar. 29, 1968, 15,327/68
Int. Cl. B01j *1/10*
U.S. Cl. 204—158 8 Claims

Azacarbazoles are prepared by the photocyclisation of a secondary or tertiary diaryl amine in which each of the two aryl groups is a monocyclic six membered ring attached to the amine nitrogen atom by a nuclear carbon atom and at least one of the aryl groups contains at least one nitrogen atom in the nucleus. A halogen atom may be substituted in the azacarbazole so formed by reaction with a peracid to form an N-oxide derivative thereof which is subsequently reacted with a phosphorus oxyhalide to introduce the halogen atom with elimination of the N-attached oxygen. The halogen substituted azacarbazole may be reacted with a nucleophile to replace the halogen substituent with the residue of the nucleophile. The azacarbazoles have antiviral activity and/or may be employed as intermediates for the production of derivatives having antiviral properties and the 1,6-diazacarbazoles and 1,3,8-triazacarbazoles are new compounds.

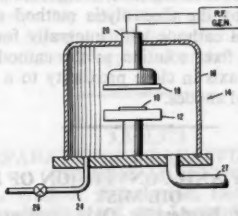
3,560,362
METHOD AND APPARATUS FOR PROMOTING CHEMICAL REACTIONS BY MEANS OF RADIOACTIVE INERT GASES
Tomomichi Kasamatsu and Norikatsu Ohtsuka, Takasaki-shi, and Kaname Matsumoto, Tokyo, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan
Filed Aug. 1, 1967, Ser. No. 657,606
Claims priority, application Japan, Aug. 3, 1966, 41/50,501
Int. Cl. C08d *1/00;* C08f *1/16*
U.S. Cl. 204—159.22 6 Claims

Chemical reactions are promoted by dissolving a radioactive inert gas in a liquid reaction system.

3,560,363
METHOD FOR CONTROL OF OXYREACTIVE HYDROCARBON LEVELS IN OXYGEN-CONTAINING GASES
Alexander Goetz, Los Angeles, Calif., assignor to Alexander Goetz, trustee of the Goetz family trust
Filed Sept. 26, 1967, Ser. No. 676,369
Int. Cl. B01j *1/10, 1/14*
U.S. Cl. 204—162 27 Claims

The smog-generating potential of a gas to be released to the atmosphere such as auto exhaust gas or the gaseous effluent from a chemical process vessel is lowered prior to release of the gas to the atmosphere by converting the smog precursor compounds, i.e. oxyreactive hydrocarbons, which are molecularly dispersed in the gas into separable particles by irradiation and separating the particles thus produced.

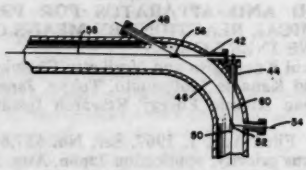
3,560,364
METHOD FOR PREPARING THIN UNSUPPORTED FILMS OF SILICON NITRIDE
Paul J. Burkhardt, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y., a corporation of New York
Filed Oct. 10, 1968, Ser. No. 766,413
Int. Cl. B29c *1/08;* C23c *15/00*
U.S. Cl. 204—192 4 Claims



A method is provided for producing extremely thin, free-standing or unsupported films of silicon nitride, having the formula Si_3N_4. The method includes the initial step of sputtered depositing, on a molybdenum substrate, a thin layer of silicon nitride. The assembly is

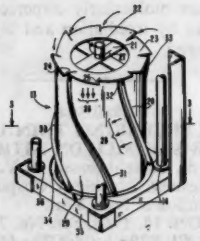
then located in an oven, heated to a temperature ranging from 500° C. to 900° C., and chlorine gas introduced into the oven. In this manner, gaseous dissolution of the substrate is effected, resulting in the production of the free-standing film of silicon nitride.

3,560,365
CORROSION PROTECTION OF PIPELINES
Walter Adolf Mueller, Dorval, Quebec, Canada, assignor to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada, a nonprofit corporation of Canada
Filed July 12, 1967, Ser. No. 652,843
Int. Cl. C23f *13/00*
U.S. Cl. 204—196 **7 Claims**



An apparatus for protecting long pipe lines against corrosion consisting of a conductor wire or rod inside the pipe, the diameters of pipe and rod being dependent upon the materials used and the liquid to be conveyed. In some cases where the throwing power of the protection is weak special arrangements are shown to protect the pipe line round bends and right up to gates of valves and pump impellers.

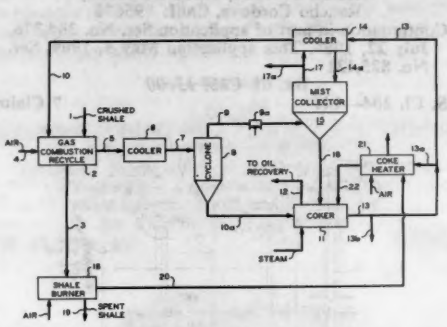
3,560,366
Ag-O-MAT SILVER RECOVERY UNIT
Oscar Fisher, Mountainville, N.Y.
(P.O. Box 2305, Newburgh, N.Y. 12550)
Filed Apr. 12, 1968, Ser. No. 720,779
Int. Cl. C23b *5/76*; C22d *1/02*
U.S. Cl. 204—212 **9 Claims**



Apparatus for recovering silver from used photographic fixing solutions by the electrolytic method employing a uniquely designed cathode with integrally formed means for agitating the fixer solution as the cathode is rotated about a vertical axis in close proximity to a plurality of vertically disposed anodes.

3,560,367
RECOVERY AND CONVERSION OF SHALE OIL MIST
Harry W. Parker, Bartlesville, Okla., assignor to Phillips Petroleum Company, a corporation of Delaware
Filed Oct. 13, 1966, Ser. No. 586,533
Int. Cl. C10g *1/00*
U.S. Cl. 208—11 **7 Claims**

Shale oil mist is recovered by collecting it in a solid, sub-divided mass, e.g., coke or catalyst, as in a fluidized bed and then converted in a conversion zone. In a specific embodiment, cooled vapors from an oil shale retorting zone are treated to separate liquid oil and an oil mist therefrom, the oil mist is adsorbed on a solid, subdivided



mass and the mass containing the adsorbed mist is passed to a conversion zone.

3,560,368
TRAVELING GRATE METHOD FOR THE RECOVERY OF OIL FROM SHALE
Chester A. Rowland, Shorewood, and Robert D. Frans, Brookfield, Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed June 5, 1968, Ser. No. 734,666
Int. Cl. C10g *1/00*
U.S. Cl. 208—11 **3 Claims**

A method is disclosed for recovering oil from oil bearing shale rock in which the rock is screened to provide three size fractions, large size, intermediate size and small size. The large size need have no upper size limit but may, for example, be screened to plus 1 inch minus 1½ inch. The intermediate size may be plus ⅝ inch minus 1 inch; and the small size plus ¼ inch minus ⅝ inch. Such size fractions are deposited on a traveling grate in a segregated bed with the large size on top, the intermediate size on the bottom and the small size therebetween. The traveling grate carries this bed through a preheating zone where moderately heated gases (from a retorting zone such as will be described) pass upwardly through the bed and then the bed passes through a retorting zone where oil is educted from the shale by highly heated gases passing downward through the bed. In the retorting zone the bottom layer of intermediate size particles prevents the smallest particles falling through or plugging gas passages in the grate while the largest and most difficult to process particles make first contact with gases that are the hottest and contain the least amount of educted oil, for maximum temperature and mass (i.e., oil) transfer therebetween, and these largest particles shield the smallest particles from the highest temperature of the gases in the retorting zone to prevent the smallest particles adhering together in a manner that would destroy the gas permeability of the bed on the grate. In the preheating and condensing zone the top layer of the largest particles provides a barrier against fine particles escaping with the gas stream containing oil mist.

3,560,369
RETORTING OIL SHALE INCLUDING AGGLOMERATED FINES
Chester A. Rowland, Shorewood, and Robert D. Frans, Brookfield, Wis., assignors to Allis-Chalmers Manufacturing Company
Filed June 5, 1968, Ser. No. 734,667
Int. Cl. C10g *1/02*
U.S. Cl. 208—11 **3 Claims**

A system is disclosed for recovering oil from oil bearing shale rock in which the rock is screened to separate fines from larger particles having a dimension of at least

about ¼ inch. The system includes a retorting zone in which heated gases, reducing or neutral, are passed through the larger particles and agglomerates of the fines to heat these particles and agglomerates to oil educting temperature and after which the gases, then containing educted oil, are passed through a zone in which particles and agglomerates are preheated and the gases cooled to condense the oil to small droplets and vapor in the gases. The oil is separated from the gases and into various fractions. The heaviest fractions of the oil, representing an amount in a range of from about 5% to 50% of the total oil educted, are recirculated through the system by using such oil as binder to agglomerate the fines into agglomerates of at least ¼ inch. These agglomerates may be advantageously utilized by charging them to a traveling grate apparatus with the larger particles to form a bed, with the agglomerates forming an intermediate layer between upper and lower layers of the larger particles. The larger particles will, in a preheating-condensing zone, trap and prevent escape from the bed, dust and drops of heavy binder oil (which may escape from agglomates). With either an upflow or downflow of gas in this preheating-condensing zone, heavy binder oil attempting to escape the bed will adhere to and coat particles in the upper or lower layers and dust attempting to escape the bed will adhere to the larger particles coated by the heavy binder oil. Thus, both the heavy binder oil and dust attempting to escape in this preheating-condensing zone will be trapped in the bed. In the retorting zone such heavy fraction binder oil retained in the bed will pyrolyze to produce further useful lighter oil, which will leave the bed as vapor, and residual coke which will remain in the bed.

3,560,370

MANUFACTURE OF LUBRICATING OIL WITH THE USE OF NEW CATALYSTS

Alain Billon, Montesson, and Michel Derrien, Rueil Malmaison, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil Malmaison, France

No Drawing. Filed June 21, 1968, Ser. No. 738,816
Claims priority, application France, June 30, 1967, 112,786
Int. Cl. C10g *13/02*
U.S. Cl. 208—111 **15 Claims**

The present disclosure is directed to a catalyst composition used in hydrocracking processes and a process for manufacturing said catalyst compositions which comprises a carrier resulting from the precipitation of alumina gel on particles of silica gel or the precipitation of silica gel on particles of alumina gel and an active component selected from the group consisting of the metals of Groups VI–A and VIII of the Periodic Table.

3,560,371

RECOVERY OF BITUMEN FROM BITUMINOUS SAND WITH CONTROL OF BITUMEN PARTICLE SIZE

Victor P. Kaminsky, Edmonton, Alberta, Canada, assignor to Cities Service Athabasca, Inc., Imperial Oil Limited, Atlantic Richfield Corporation, and Royalite Oil Company, Limited, fractional part interest to each

No Drawing. Filed June 17, 1968, Ser. No. 737,299
Int. Cl. C10g *1/04*
U.S. Cl. 208—11 **5 Claims**

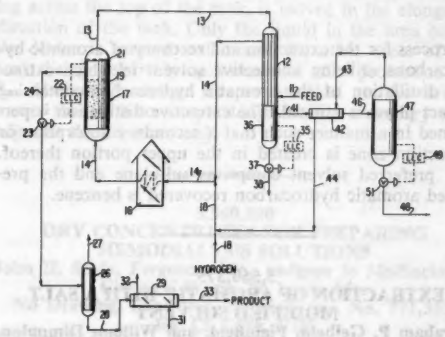
Bitumen is recovered from an aqueous slurry of bituminous sand by introducing the slurry into a body of water in a separation zone. Bitumen floats to the top in the form of bituminous emulsion for recovery therefrom and sand settles to the bottom for removal therefrom. Sufficient shearing energy is imparted to the slurry during its introduction into the separation zone or while in the body of water in the separation zone to reduce the size of the particles of bitumen so that at least about 80% of the bitumen particles in the body of water are in the size range between about 50 and about 200 microns. The necessary shearing energy can be imparted by dispersing the slurry into the body of water through a high shear turbine impeller. Less than about 40% of the bitumen in the slurry introduced into the separation zone is usually in the form of particles in the 50 to 200 microns size range, prior to the application of shearing forces in accordance with the invention and for such slurry an energy input of between about 200 and about 2,000 ft.-lbs. of shearing energy per pound of slurry is usually sufficient to reduce the bitumen particles to the required size range.

3,560,372

HYDROGENATION OF HEAVY HYDROCARBON OIL

Roger P. Van Driesen, Hopewell, N.J., assignor to Cities Service Research and Development Company, New York, N.Y., a corporation of Delaware

Filed Dec. 26, 1967, Ser. No. 693,342
Int. Cl. C10g *9/16, 7/00*
U.S. Cl. 208—48 **2 Claims**



Operating problems in heat exchangers in which liquid product from the hydrogenation of heavy hydrocarbon oils is cooled are avoided by controlling the ratio of vapor to liquid in the liquid product streams passing through such exchanger so that the vapor to liquid ratio of liquid product within the passageways of such exchangers is maintained at less than about one volume of vapor per volume of liquid. Vapor to liquid ratios in excess of 1:1 and especially ratios in the range of between 1:1 and 5:1 in such situations have been found to cause laminar flow along the walls of the passages of the exchangers, frequently resulting in poor heat exchange efficiency and deposits of solid material, and sometimes leading to complete plugging of exchangers.

3,560,373

SEPARATION OF PARAFFINS AND CHLOROPARAFFINS

Thomas A. Washall, Wilmington, Del., and Frank W. Melpolder, Wallingford, and Leonard N. Leum, Media, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa., a corporation of Pennsylvania

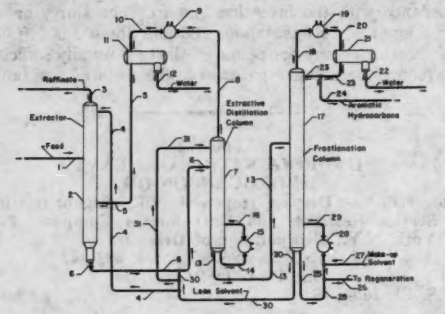
No Drawing. Filed Sept. 16, 1968, Ser. No. 762,360
Int. Cl. C07c *9/14;* **C10g** *25/00*
U.S. Cl. 208—262 **6 Claims**

Separation of straight chain paraffins, monochloroparaffins and polychloroparaffins by a cyclic silica gel adsorption process.

3,560,374
AROMATIC EXTRACTION PROCESS

Adrian J. Gruia, Corpus Christi, Tex., assignor to Universal Oil Products Company, Des Plaines, Ill., a corporation of Delaware

Filed Dec. 18, 1968, Ser. No. 784,631
Int. Cl. C10g 21/22
U.S. Cl. 208—313 6 Claims

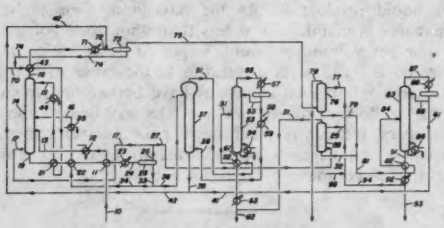


Process for the extraction and recovery of aromatic hydrocarbons utilizing a selective solvent in which extractive distillation of the aromatic hydrocarbon-containing extract phase is utilized. The extractive distillation is performed in a manner such that a secondary absorption or extraction zone is created in the upper portion thereof. The preferred solvent comprises sulfolane and the preferred aromatic hydrocarbon recovered is benzene.

3,560,375
EXTRACTION OF AROMATIC WITH A SALT MODIFIED SOLVENT

Abraham P. Gelbein, Plainfield, and William Dimoplon, Jr., Bloomfield, N.J., assignors to The Lummus Company, Bloomfield, N.J., a corporation of Delaware

Filed Apr. 28, 1969, Ser. No. 819,743
Int. Cl. C10g 21/02; C07c 7/10
U.S. Cl. 208—324 14 Claims

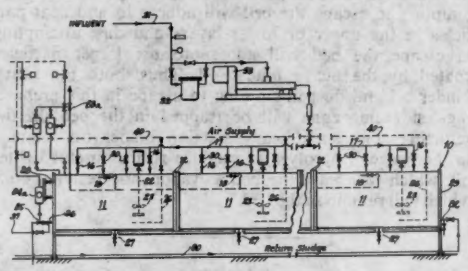


A process for separating a non-aromatic hydrocarbon fraction and an aromatic hydrocarbon fraction from a mixture thereof wherein the mixture is contacted at a temperature between about 200° F. and about 400° F. with an extraction solvent of a highly polar organic liquid having 10–50 weight percent of soluble metal salt dissolved therein, preferably a salt of lithium, beryllium or magnesium, whereby the aromatic hydrocarbon fraction is extracted from the mixture. The extraction solvent is cooled to a temperature below about 150° F., at which temperature a substantial portion of the aromatic hydrocarbon fraction is insoluble therein. Any remaining aromatic hydrocarbon fraction may be recovered from the extraction solvent by contacting the extraction solvent with a non-aromatic hydrocarbon solvent at a temperature no greater than 150° F., at which temperature the aromatic hydrocarbon fraction is selectively extracted from the extraction solvent.

3,560,376
METHOD AND APPARATUS FOR USE IN THE ACTIVATED SLUDGE TREATMENT OF SEWAGE

Richard W. Heil, Clarendon Hills, Ill., assignor to Metropolitan Sanitary District of Greater Chicago, Chicago, Ill., a corporation of Illinois

Filed Oct. 30, 1968, Ser. No. 783,157
Int. Cl. C02c 1/12
U.S. Cl. 210—7 14 Claims



An apparatus and method used in the activated sludge treatment of secondary sewage utilizes a pressure aeration tank for treating a continuous flow of sewage influent. The tank is maintained at pressures up to 60 p.s.i. and the mixed liquor in the tank is continuously aerated. Influent is introduced in the aeration tank through a distribution manifold at spaced points longitudinally of the tank.

Upon entering the aeration tank, the influent is intermixed with return activated sludge (made up of living micro-organisms) forming a mixed liquor. Within the mixed liquor, micro-organisms feed upon the sewage nutrients, consuming them by adsorption and absorption. The flow of influent through each branch of the manifold is separately controlled so as to maintain the nutrient feed level of the mixed liquor uniform throughout the tank. The mixed liquor passes from the aeration tank to a clarifier which is also maintained at the same pressure as the treatment tank.

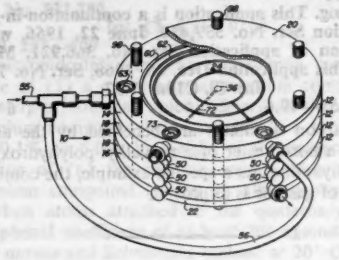
3,560,377
APPARATUS AND PROCESS FOR FILTERING FLUIDS

Herbert H. Loeffler, Arlington, Mass., assignor to Amicon Corporation, Lexington, Mass.

Filed Jan. 21, 1969, Ser. No. 792,636
Int. Cl. B01d 13/00
U.S. Cl. 210—23 18 Claims

Novel apparatus for processing of fluids under pressure and comprising a stack of novel disc-like processing units suitable for supporting filters, membranes, or other surfaces with which intimate contact is desired wherein said processing units are advantageously nested together. Proc-

essing units also comprise integral flow-directing means and fluid-collecting means and may be arranged by suitable plugging of conduits to provide a variety of flow configurations throughout the apparatus. The novel proc-



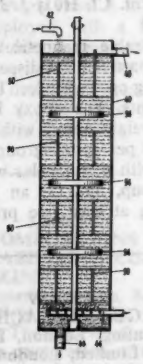
essing units are also subject of the instant invention as is the process whereby liquid processing may be carried out, e.g. in such apparatus, without short-circuiting of the liquid streams while avoiding excessive leakage.

3,560,378

ION-EXCHANGE PROCESS

Donald Eric Weiss, Blackburn, Victoria, Brian Alfred Bolto, Mitcham, Victoria, Donald Willis, Blackburn, Victoria, Robert McNeill, Chelsea, Victoria, and Douglas Lyons Ford, Waverley, New South Wales, Australia; said Weiss, Bolto, Willis, and McNeill assignors to Commonwealth Scientific and Industrial Research Organization, East Melbourne, Victoria, and said Ford assignor to Union Carbide Australia Limited, Sydney, New South Wales, Australia

Filed Apr. 19, 1968, Ser. No. 722,641
Claims priority, application Australia, Apr. 20, 1967, 20,648/67
Int. Cl. B01d *15/02, 15/04*
U.S. Cl. 210—36 **11 Claims**



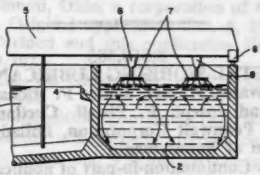
An ion exchange process utilizing an ion exchange adsorbent having a particle size less than 210 microns and having ferromagnetic properties. The adsorbent, in the magnetized state, is mixed with liquid to be treated to form an agitated suspension. The adsorbent is separated from the treated liquid by allowing the same to magnetically flocculate in the absence of mixing.

3,560,379

METHOD AND APPARATUS FOR TREATING WATER

Josef Muskat, Michelbach, Germany, assignor to Passavant Werke, Michelbacherhutte, Germany, a corporation of Germany

Filed Feb. 20, 1969, Ser. No. 801,034
Claims priority, application Germany, Mar. 14, 1968, P 17 08 604.3
Int. Cl. C02c *1/18*
U.S. Cl. 210—49 **15 Claims**



A method and apparatus in which a liquid to be treated is placed in an elongated aeration tank and an aeration device, adjustably mounted on a bridge extending across the top of the tank, is moved in the elongated direction of the tank. Only the liquid in the area below the device is aerated and mixed, the other areas of the tank being relatively quiescent for the promotion of flocculation. A sludge scraper attached to the bridge moves therewith to scrape sludge from a secondary tank adjacent the aeration tank.

3,560,380

DRY CONCENTRATES FOR PREPARING HEMODIALYSIS SOLUTIONS

John H. Stade, Ferguson, Mo., assignor to Mallinckrodt Chemical Works, St. Louis, Mo.

No Drawing. Filed Oct. 28, 1968, Ser. No. 771,351
Int. Cl. C09k *3/00*
U.S. Cl. 252—1 **7 Claims**

Stable dry concentrates for preparing hemodialysis solutions comprising salts of sodium, magnesium and calcium and, optionally, also a potassium salt and dextrose, contain a substantial proportion of sodium acetate which has been spray-dried to a very low moisture content, e.g. not more than 0.2% by weight, the total moisture content of the concentrate being not greater than 0.75% by weight. Such concentrates show greatly increased resistance to caking and discoloration and even after prolonged storage dissolve completely in water to give clear colorless solutions.

3,560,381

HIGH DENSITY BORON PRODUCT COMPRISING A MECHANICAL MIXTURE OF BORIC OXIDE WITH ANHYDROUS BORAX OR SODIUM TETRABORATE PENTAHYDRATE

Frank T. Winters, Jr., La Crescenta, John C. Middleton, Yorba Linda, and Lawrence L. Schwalley, Whittier, Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif., a corporation of Nevada

No Drawing. Filed Apr. 30, 1968, Ser. No. 725,482
Int. Cl. A01n *9/02;* **C09k** *3/28*
U.S. Cl. 252—8.1 **10 Claims**

A high density, water soluble boron product formed from a mechanical mixture of boric oxide with either anhydrous borax or sodium tetraborate pentahydrate (borax 5 mol). The product has a Na_2O/B_2O_3 molar ratio of from .16 to .32 and a loose density of greater than 50 pounds/cu. ft.

3,560,382
NYLON CARPET YARN FINISH
Neil Lamar Finch, Sr., Kinston, N.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Nov. 8, 1967, Ser. No. 681,595
Int. Cl. D06m *13/26, 13/18*
U.S. Cl. 252—8.9 5 Claims

A nylon fiber finish which includes a soft paraffin wax, a hard microcrystalline wax, a salt of a partial phosphate ester, a polyoxyalkylene derivative of a fatty alcohol and potassium hydroxide, provides nylon fibers, filamens, tows and yarns with highly satisfactory antistatic properties and filament to filament frictional characteristics.

3,560,383
METAL WORKING LUBRICANTS
Norbert Schwartz, Homer, James F. Richards, Cortland County, and Joseph F. Pistell, Cortland, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa., a corporation of Pennsylvania
No Drawing. Continuation-in-part of application Ser. No. 686,300, Nov. 28, 1967. This application Feb. 14, 1969, Ser. No. 799,513
Int. Cl. C10m *1/24, 1/32*
U.S. Cl. 252—34.7 8 Claims

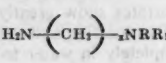
Lubricant compositions particularly useful for metal working comprising a soap base and as an improving agent, a compound selected from the group of (1) acetylenic alcohols, (2) acetylenic glycols, and (3) ethoxylated acetylenic glycols.

3,560,384
ASHLESS LUBRICANT ADDITIVE
Robert A. Halling, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware
No Drawing. Filed Oct. 14, 1968, Ser. No. 767,486
Int. Cl. C10m *1/48*
U.S. Cl. 252—46.7 5 Claims

An ashless lubricant additive which improves the viscosity index, the anti-corrosion, anti-oxidant, anti-wear and detergent properties of the base oil. The additive is the reaction product of

(A) a phosphosulfurized ethylene/propylene/1,4-hexadiene terpolymer having an average molecular weight of between about 3,500 and about 65,000 and containing about 35–70 weight percent propylene, about 1–6 weight percent 1,4-hexadiene and the remainder being ethylene; with

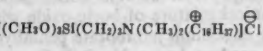
(B) an amine of the formula



wherein x is an integer of 2 or 3, and R and R_1 are alkyl groups of 1–4 carbon atoms.

3,560,385
METHOD OF LUBRICATING SILICEOUS MATERIALS
Charles A. Roth, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.
No Drawing. Filed Nov. 1, 1968, Ser. No. 772,851
Int. Cl. C10m *1/50*
U.S. Cl. 252—49.6 7 Claims

An organosilicon quaternary ammonium compound, such as



is applied to the surfaces of solid siliceous material, for example, glass fibers, as a lubricant.

3,560,386
HYDROCARBON DISTILLATE CONTAINING BORON ESTER OF POLYALKYL-POLYHYDROXYALKYL-ALKYLENEPOLYAMINE
Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill., a corporation of Delaware
No Drawing. This application is a continuation-in-part of application Ser. No. 559,410, June 22, 1966, which is a division of application Ser. No. 366,921, May 12, 1964. This application Dec. 26, 1968, Ser. No. 787,203
Int. Cl. C10m *7/02*
U.S. Cl. 252—49.6 6 Claims

Hydrocarbon distillates are benefited by the addition thereto of a boron ester of a polyalkyl-polyhydroxyalkyl-alkylenepolyamine. As a specific example, the combustion properties of gasoine is improved.

3,560,387
LUBRICATING OILS
Wolfgang Schritt, Hamburg, Germany, assignor to Deutsche Erdol-Aktiengesellschaft, Hamburg, Germany, a corporation of Germany
No Drawing. Filed Feb. 19, 1968, Ser. No. 706,633
Claims priority, application Germany, Feb. 23, 1967, D 52,371
Int. Cl. C10m *1/26*
U.S. Cl. 252—56 5 Claims

Lubricant containing as an essential ingredient imparting lubricating properties, ester of 2,2-dialkylpropanediol-1,3 and monocarboxylic acid, wherein at least one of the alkyl groups contains more than 4 carbon atoms. The lubricants are well suited for use in aircraft and gas turbine engines.

3,560,388
MAGNETIC COATING COMPOSITION WITH THREE COMPONENT EPOXY BINDER
Louis M. Higashi, Monte Sereno, Calif., assignor to Memorex Corporation, Santa Clara, Calif., a corporation of California
No Drawing. Continuation-in-part of application Ser. No. 735,997, June 11, 1968, which is a continuation-in-part of application Ser. No. 619,017, Feb. 27, 1967. This application July 22, 1969, Ser. No. 843,842
Int. Cl. H01j *1/37*
U.S. Cl. 252—62.54 5 Claims

A fluid, heat curable magnetic coating composition in which magnetic particles are dispersed in a three component thermosetting epoxy binder. The coating also contains volatile solvents. The epoxy binder contains (1) a high equivalent weight epoxy with a molecular weight of about 400–4,000 per epoxy group, (2) a low equivalent weight epoxy with a molecular weight of about 130–211 per epoxy group, and (3) an aromatic polyamine curing agent having at least two primary amine groups per molecule.

3,560,389
LIQUID DETERGENT BLEACH COMPOSITION
Anthony L. L. Hunting, London, England, assignor to Cyclo Chemicals Limited, London, England, a British company
No Drawing. Filed Aug. 8, 1967, Ser. No. 661,761
Claims priority, application Great Britain, Aug. 11, 1966, 36,041/66
Int. Cl. C11d *7/54*
U.S. Cl. 252—95 7 Claims

A liquid detergent bleach composition comprising an aqueous mixture of a detergent, a bleaching or oxidizing agent, and a hydrotrope in which the components are present in such an amount so as to provide a clear liquid at room temperature is disclosed.

3,560,390

ANTIMICROBIC DETERGENTS

Irving Gaines, Montclair, N.J., assignor to Millmaster Onyx Corporation, New York, N.Y., a corporation of New York

No Drawing. Continuation-in-part of application Ser. No. 602,550, Dec. 19, 1966. This application May 24, 1968, Ser. No. 731,702

Int. Cl. C11d *9/50*

U.S. Cl. 252—107 **4 Claims**

A microbiocidal detergent composition comprising a mixture of (1) a quaternary ammonium compound and (2) a soap or non-soap anionic detergent, the quaternary ammonium compound being present in a proportion of about 0.1% to 5.0% by weight of the composition and consisting of (a) the cationic residue of a quaternary ammonium compound having an alkyl group of 12 to 18 carbon atoms attached to the quaternary nitrogen and a phenol coefficient of at least 200 against *Staphylococcus aureus* and *Salmonella typhosa* at 20° C., and (b) an organic anion consisting of the residue of either an acidic or pseudoacidic organic compound having a replaceable hydrogen.

3,560,391

DETERGENT COMPOSITIONS CONTAINING PHOSPHONIO CARBOXYLATES

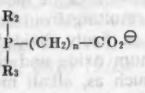
Francis L. Diehl and Howard F. Drew, Wyoming, and Robert G. Laughlin, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio, a corporation of Ohio

No Drawing. Original application Aug. 23, 1966, Ser. No. 574,470. Divided and this application Jan. 26, 1970, Ser. No. 5,900

Int. Cl. C11d *1/04, 3/06*

U.S. Cl. 252—135 **7 Claims**

Phosphonio carboxylates having effective detergency in cool water laundering and having the following general formula are disclosed:



R_1 is C_{10}–C_{18} alkyl; R_2 and R_3 are each C_1–C_4 alkyl or hydroxyalkyl; n ranges from 3 to 5. The phosphonio carboxylates are employed with a builder material selected from water-soluble inorganic alkaline builder salts, organic alkaline sequestrant builder salts and mixtures thereof, in a ratio of detergent compound to builder material of from about 4:1 to about 1:20. A cool water laundering process is also disclosed.

3,560,392

DETERGENT COMPOSITIONS CONTAINING ENZYME-STABILIZING COLLAGEN-DERIVED PROTEINS

Jean-Pierre D. B. Eymery, Brussels, Belgium, and Harold H. Beyer, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio, a corporation of Ohio

No Drawing. Continuation-in-part of application Ser. No. 686,403, Nov. 29, 1967. This application Aug. 27, 1968, Ser. No. 755,710

Int. Cl. C11d *3/065*

U.S. Cl. 252—138 **17 Claims**

Granular detergent compositions containing a mixture of organic detergent and an alkaline builder salt in a weight ratio of builder salt to organic detergent of about 30:1 to about 1:4; a proteolytic enzyme characterized by enzymatic activivty in the pH range of from about to about 12 at a temperature of about 50° F. to about 200° F.; and a stabilizing amount of a proteinaceous partially hydrolyzed and partially solubilized collagen, said partially hydrolyzed and partially solubilized collagen having an average molecular weight in the range of about 5,000 to about 250,000.

3,560,393

DETERGENT COMPOSITIONS CONTAINING REVERSED ZWITTERIONIC PHOSPHORUS COMPOUNDS

Roger E. Zimmerer, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio, a corporation of Ohio

No Drawing. Original application Oct. 4, 1966, Ser. No. 584,099. Divided and this application Feb. 10, 1970, Ser. No. 10,302

Int. Cl. C11d *3/30, 3/34, 3/36*

U.S. Cl. 252—152 **4 Claims**

Detergent compositions containing reversed zwitterionic compounds having a negatively charged center adjacent a hydrophobic chain and a positively charged center removed by 2 to about 4 carbon atoms from the negatively charged center are disclosed. These compounds have the formula R—Z—R^1—X wherein R is an aliphatic radical, e.g., alkyl or alkenyl, containing from about 10 to about 20 carbon atoms; Z is a negatively charged radical selected from the group consisting of phosphate, phosphonate, and phosphinate radicals; R^1 is an alkylene radical containing from 2 to about 4 carbon atoms; and X is a positively charged radical selected from the group consisting of ammonium and tertiary sulfonium radicals; said ammonium radical having the formula

wherein R^2, R^3 and R^4 are selected from the group consisting of hydrogen, methyl, and ethyl; said tertiary sulfonium radical having the formula

wherein R^5 and R^6 are selected from the group consisting of methyl and ethyl.

3,560,394

EXTRACOORDINATE SILICON COMPLEXES CONTAINING A CYCLIC ANHYDRIDE OF A POLYCARBOXYLIC ORGANIC ACID

Edwin P. Plueddemann and Harold L. Vincent, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich., a corporation of Michigan

No Drawing. Application Nov. 16, 1964, Ser. No. 412,590, now Patent No. 3,461,095, dated Aug. 12, 1968, which is a continuation-in-part of application Ser. No. 358,504, Apr. 9, 1964. Divided and this application Oct. 23, 1968, Ser. No. 770,059

Int. Cl. C08g *51/80*

U.S. Cl. 252—182 **17 Claims**

A curing agent for epoxy resins is disclosed which comprises a cyclic anhydride of a polycarboxylic organic acid and an extracoordinate silicon complex.

3,560,395

AQUEOUS KETONE PEROXIDE-HYDROGEN PEROXIDE COMPOSITION

Solomon Crigg Westbrook, Jr., Buffalo, N.Y., assignor to Pennwalt Corporation, a corporation of Pennsylvania

No Drawing. Filed Sept. 12, 1968, Ser. No. 792,179

Int. Cl. C08f *1/60*

U.S. Cl. 252—186 **13 Claims**

A peroxide solution composition consisting essentially of a single alkanone peroxide, hydrogen peroxide, water,

and organic solvent; having an active oxygen content of about 5–16%; the peroxide content having been prepared by reaction of the total alkanone and hydrogen peroxide in aqueous medium, which peroxidation product mixture becomes part, or all, of the final composition.

The peroxide solution composition is especially useful in the curing of water extended unsaturated polyester resins.

3,560,396

CALCIUM HYPOCHLORITE COMPOSITIONS CONTAINING SPRAY-DRIED SODIUM NITRATE

Homer L. Robson, Hamden, Conn., assignor to Olin Corporation, a corporation of Virginia

No Drawing. Filed July 28, 1967, Ser. No. 656,688

Int. Cl. C01b *11/06;* **C09k** *3/00*

U.S. Cl. 252—187 **3 Claims**

Calcium hypochlorite compositions, suitable for bleaching and sanitation uses, are provided which have lowered rates of propagation of decomposition when heated. These novel compositions incorporate, with calcium hypochlorite, a spray-formed sodium nitrate preparation in suitable proportions. Also novel are spray-formed sodium nitrate preparations containing added diluents.

3,560,397

PHOTOLUMINESCENT PHOSPHORS

Frank J. Avella, Flushing, N.Y., assignor to General Telephone and Electronics Laboratories, Inc.

No Drawing. Filed Sept. 27, 1965, Ser. No. 490,706

Int. Cl. C09k *1/44*

U.S. Cl. 252—301.1 **13 Claims**

A family of phosphor compositions having the formula $M^{2+}_{0.5}RM^{4+}_{0.5}VO_4$ where M^{2+} is a divalent element selected from the group consisting of calcium, strontium, cadmium, and zinc, M^{4+} is a tetravalent element selected from the group consisting of zirconium and thorium and R is a rare earth activator. The phosphors emit red light under ultraviolet excitation and may be used for color correction in high pressure mercury lamps.

3,560,398

PHOSPHORS FOR COLOR DISPLAY SYSTEMS

Samuel R. Shortes, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex., a corporation of Delaware

Filed Dec. 2, 1966, Ser. No. 598,826

Int. Cl. C09k *1/12;* **H01j** *29/20*

U.S. Cl. 252—301.6 **9 Claims**

Disclosed are phosphor particles which emit light of different hues when energized by electrons of different energy levels, each particle being a compound phosphor material such as zinc cadmium sulfide (silver activated), having a core portion in which the constituents exist in a first ratio and having a surrounding outer surface portion in which the constituents exist in a second ratio different from the first, the constituent ratio varying gradually from the inner core portion ratio to the outer core portion ratio.

3,560,399

ACTIVATED DEVELOPER AND METHOD OF FLAW DETECTION

John E. Irsak, Bay Village, Ohio, assignor to Day-Glo Color Corporation

No Drawing. Filed Oct. 24, 1965, Ser. No. 504,980

Int. Cl. C09k *3/22;* **G01n** *21/16*

U.S. Cl. 252—301.2 **8 Claims**

Sensitivity of powder-developed penetrant system of flaw detection increased by partially pre-wetting of powdered developer with solvator for flaw-indicating dye. The presence of solvator for the dye provides the option of carrying (or not carrying) at least some of at least one of what would otherwise be a component of a flaw penetrant liquid, such as one or more flaw-indicating dyes.

3,560,400

PROCESS FOR CONCENTRATING SILICA AQUASOLS

Henry Thomas Joseph Chilton, Llangollen, Wales, assignor to Monsanto Chemicals Limited, London, England, a British company

No Drawing. Filed Dec. 13, 1967, Ser. No. 690,061

Claims priority, application Great Britain, Dec. 23, 1966, 57,649/66

Int. Cl. B01d *13/00;* **B01j** *13/00*

U.S. Cl. 252—313 **6 Claims**

Process for the production of a concentrated silica aquasol, which process comprises the removal of water from a dilute silica aquasol which is contained in one compartment which is separated from a second compartment by a membrane which is permeable by water molecules but not by the colloidal particles of silica. The water transfers from said aquasol in the first compartment to a liquid contained in the second compartment by means, for example, of pressure applied to the aquasol. An improvement in the throughput is achieved by pretreating the aquasol with ion-exchange resins to reduce the pH to a value of from about 2 to about 4.

3,560,401

PERSISTENT ANTIFOAM COMPOSITIONS AND METHODS OF MAKING SAME UTILIZING BASIC MATERIALS

Matthew J. O'Hara, Spring Valley, and Donald R. Rink, Yorktown Heights, N.Y., assignors to Union Carbide Corporation, a corporation of New York

No Drawing. Filed Aug. 11, 1967, Ser. No. 659,870

Int. Cl. B01d *19/04*

U.S. Cl. 252—358 **17 Claims**

Antifoam compositions having persistent effectiveness especially in aqueous alkaline medium, said compositions being a mixture resulting from heating a poly(diorganosiloxane) liquid, a finely divided inorganic filler, such as, silica, aluminum oxide and titanium dioxide, and a basic material, such as, alkali metal and alkaline earth metal oxides, hydroxides, alkoxides, aryloxides and silanolates, tetraalkylammonium hydroxides, alkoxides and silanolates, tetraalkylphosphonium hydroxides, alkoxides and silanolates, trialkylhydrazinium hydroxides, alkoxides and silanolates, and trialkylguanidinium hydroxides, alkoxides, and silanolates, and monoalkyl, dialkyl and trialkyl amines. Also, alkaline aqueous liquids, e.g., synthetic rubber latices, containing such novel antifoam compositions.

Processes for producing such persistent antifoam compositions by heating the poly(dimethylsiloxane) liquid in the presence of the finely divided inorganic filler and the basic material as above illustrated at a temperature in a broad range, for example, 100 to 300° C., for a period of time in a broad range, e.g., one-half to five hours. Also, processes for suppressing foam over long periods utilizing such novel antifoam compositions.

3,560,402

APPARATUS FOR MECHANICALLY BREAKING STABLE FOAMS

Jack F. Kilborn, Natchez, Miss., Clarence W. Scott, Panama City, Fla., and Kenneth W. Hobbs, Springhill, La., assignors to International Paper Company, New York, N.Y., a corporation of New York

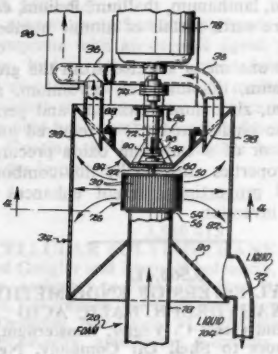
Filed Apr. 10, 1968, Ser. No. 720,092

Int. Cl. B01d *19/00*

U.S. Cl. 252—361 **5 Claims**

A stable foam of bubbles is expanded and drawn by a vacuum source through a riser and into a mechanical

foam breaker. The breaker reduces the expanded foam to its liquid and gaseous components and disperses the liquid as discrete droplets against the walls of an enclosing chamber. The walls are spaced from the breaker to prevent mechanical agitation of the liquid collected after separating it from the dispersed liquid. The liquid is drained from the chamber by gravity through a barometric leg.



3,560,403

PERSISTENT ANTIFOAM COMPOSITIONS AND METHODS OF MAKING SAME UTILIZING DIALKYLAMINO ORGANOSILICONE FLUIDS

Matthew J. O'Hara, Spring Valley, and Donald R. Rink, Yorktown Heights, N.Y., assignors to Union Carbide Corporation, a corporation of New York

No Drawing. Filed Aug. 11, 1967, Ser. No. 659,871

Int. Cl. B01d *19/04*

U.S. Cl. 252—358 **9 Claims**

Antifoam compositions having persistent effectiveness especially in aqueous alkaline medium, said compositions being a mixture containing an organosiloxane liquid polymer or other non-aqueous liquid, such as, a hydrocarbon oil or a polyoxyalkylene glycol, and a hydroxyl containing, finely divided, inorganic filler, such as, silica, aluminum oxide and titanium dioxide, reacted with a dialkylamino organosilicone fluid, such as those of the formula $(R'_2N)_x(SiR_2O)_nSiR_2(R)_{2-x}$ wherein x is 1 to 2, n is 0 to 40 and R is an alkyl group having 1 to 10 carbon atoms and R' is an alkyl group having 1 to 3 carbon atoms.

3,560,404

REACTIVATING PYROPHORIC TYPE CATALYSTS IN AN ORGANIC SOLVENT

Margarete Jung, Kelkheim, and Hans H. von Dohren, Frankfurt am Main, Germany, assignors to Varta Aktiengesellschaft, Frankfurt am Main, Germany

No Drawing. Filed Dec. 20, 1967, Ser. No. 691,986

Claims priority, application Germany, Dec. 30, 1966, V 32,673

Int. Cl. B01j *11/02, 11/30*

U.S. Cl. 252—414 **7 Claims**

Process for the reactivation of deactivated hydrogenation catalyst which as main catalytic components contain catalytically active forms of the metallic elements iron, nickel and cobalt comprising introducing the catalyst to be reactivated into a non-aqueous organic liquid and contacting such catalyst therein with a strong reducing agent, such as, hydrazine, borohydrides or hypophosphites until development of gaseous hydrogen occurs.

3,560,405

BUTADIENE POLYMERIZATION AND CATALYST SYSTEMS THEREFOR

Robert P. Zelinski, Bartlesville, Okla., and Rudolf H. Gaeth, Lake Jackson, Tex., assignors to Phillips Petroleum Company, a corporation of Delaware

No Drawing. Filed Feb. 26, 1968, Ser. No. 707,951

Int. Cl. C08f *1/44*

U.S. Cl. 252—429 **3 Claims**

A catalyst system comprising (1) a molybdenum trihalo dicarboxylate and a mixture of (2) an organometallic compound or a lithium aluminum hydride represented by the formulas R_mAlCl_n, $LiAlH_xR_{(4-x)}$, and RyM wherein R is a saturated aliphatic, saturated cycloaliphatic, or aromatic hydrocarbon radical or combinations thereof containing from 1 to 20 carbon atoms, m and n are integers of 1 or 2 such that $m+n=3$, x is an integer of from 0 to 4, M is lithium, sodium, potassium, rubidium, cesium, beryllium, magnesium, zinc, cadmium, aluminum, gallium, or indium, and y is an integer equal to the valence of the metal and (3) a nickel compound such as nickel oxide, a nickel salt of an organic or inorganic acid, a nickel salt of a beta-diketone, or a complex compound of nickel such as dicyclopentadienylnickel, nickel tetracarbonyl, or the nickel complex with the ethyl ester of acetoacetic acid or at least one transition metal compound of titanium, vanadium, chromium, molybdenum, manganese, cobalt or iron is employed for the polymerization of butadiene. Polymers ranging from high cis to high vinyl can be obtained using the catalysts of this invention. The products can be hydrogenated immediately following polymerization with the polymerization catalyst functioning as the catalyst for the hydrogenation step.

3,560,406

PROCESS AND CATALYST FOR MANUFACTURING CYCLIC KETONES BY CATALYTIC DEHYDROGENATION OF CYCLIC ALCOHOLS

Bernard Juguin, Rueil-Malmaison, France, assignor to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

No Drawing. Filed Nov. 15, 1967, Ser. No. 683,120

Claims priority, application France, Nov. 28, 1966, 85,302

Int. Cl. B01j *11/32*

U.S. Cl. 252—457 **15 Claims**

Cyclic ketones with high specificity and increased yields are produced by the catalytic dehydrogenation of cyclic alcohols. The catalyst utilized for the dehydrogenation process comprises silica, zinc oxide, at least one oxide of an alkaline earth metal and at least one basic compound of an alkaline metal.

3,560,407

METHOD OF MAKING A CATALYST COATED WITH SAMARIUM OXIDE

James C. McCormick, West Seneca, N.Y., assignor to FMC Corporation, New York, N.Y., a corporation of Delaware

Original application July 20, 1965, Ser. No. 473,328. Divided and this application Nov. 30, 1967, Ser. No. 702,764

Int. Cl. B01j *11/06*

U.S. Cl. 252—462 **4 Claims**

This invention relates to a process of making a decomposition catalyst for concentrated hydrogen peroxide com-

prising etching an alloy of silver and palladium with nitric acid and then coating the porous alloy with samarium oxide, obtained by decomposing samarium nitrate by heat.

3,560,408

CATALYTIC MINERAL FIBERS AND THEIR PREPARATION

Jean-Pierre Kiehl and Gabriel Pupier, Lyon, France, assignors to Societe Generale des Produits Refractaires, Paris, France

No Drawing. Filed Apr. 10, 1968, Ser. No. 720,324
Claims priority, application France, Apr. 10, 1967, 102,802
Int. Cl. B01j *11/06, 11/32*
U.S. Cl. 252—463 **5 Claims**

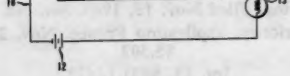
A catalytic mineral fiber containing at least 70 percent alumina, less than 20 percent of at least one catalyst distributed within the crystalline lattice or between the oxide crystals, and containing less than 30 percent other refractory oxides and less than 5 percent recrystallization inhibitors, and having a specific B.E.T. surface at least equal to 70 $m.^2/g.$ and stable up to at least 1050° C. The fiber is produced by the preparation of a solution in water of aluminum oxychloride and a hydrolyzable salt of a catalytic element along with recrystallization inhibitors. The solution has an adjusted pH between 3 and 5 and a viscosity acceptable to extrusion, drawing, etc., to form fibers that are converted into insoluble oxides in an atmosphere of steam at a temperature varied according to pressure.

3,560,409

SOLUTIONS OF METALLIC SILVER IN ISOCYANIDES

Harris D. Hartzler, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Filed Sept. 29, 1967, Ser. No. 671,823
Int. Cl. H01f *1/02;* **C23c** *3/00*
U.S. Cl. 252—514 **10 Claims**



Described are solutions of silver in isocyanides, e.g., cyclohexyl isocyanide, and the preparation thereof. The solutions are useful for making electrically conducting printed circuits at moderate temperatures.

3,560,410

RESISTOR COMPOSITIONS CONTAINING PYROCHLORE-RELATED OXIDES AND CADMIUM OXIDE

Kenneth E. Schubert, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 803,434, Feb. 28, 1969. This application Nov. 28, 1969, Ser. No. 880,941
Int. Cl. H01b *1/06*
U.S. Cl. 252—518 **10 Claims**

Resistor compositions, which yield, upon firing, smooth resistors having a wide range of resistances, low TCR's and good stability properties, comprising (1) an oxide of the formula

$$(M_xBi_{2-x})(M'_yRu_{2-y})O_{7-z}$$

wherein

M is at least one metal selected from the group consisting of yttrium, lanthanum, thallium, indium, cadmium, lead and the rare earth metals of atomic number 58–71 inclusive,

M′ is at least one metal selected from the group consisting of platinum, titanium, tin, chromium, rhodium, iridium, rhenium, zirconium, antimony and germanium, (2) an inorganic binder, and (3) a required amount of cadmium oxide or of a cadmium oxide precursor. The control over properties afforded by this combination of ingredients and proportions thereof enhances the significance of this invention.

3,560,411

EPOXYALKYL ESTERS OF ENDO-METHYLENE HEXAHYDROPHTHALIC ACID

Klaas Ruyter and Geert C. Vegter, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y., a corporation of Delaware

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,413
Claims priority, application Great Britain, Jan. 17, 1968, 2,557/68
Int. Cl. C08g *30/10*
U.S. Cl. 260—2 **9 Claims**

Composition containing one or more novel di epoxy alky and epoxy cyclo alkyl esters of unsubstituted or alkyl substituted bicyclo[2,2,1] - heptane - 2,3 - dicarboxylic acids which can be cured to useful resins.

3,560,412

THERMOSETTING COMPOSITIONS COMPRISING BLENDS OF ACETAL RESINS AND AMINE-ALDEHYDE RESINS

Joseph J. Bernardo, 92 Corabelle Ave., Lodi, N.J. 07644, and Joseph F. Ackerman, 19 Woodmere Road, Cedar Grove, N.J. 07009

No Drawing. Continuation of application Ser. No. 594,405, Nov. 15, 1966. This application Jan. 12, 1970, Ser. No. 7,298
Int. Cl. C08g *37/32, 51/72*
U.S. Cl. 260—21 **11 Claims**

Polyacetal resins are made by reacting polyols containing three or more hydroxyl groups with formaldehyde in the presence of acid catalysts. These resins, when blended with amine-formaldehyde resins, are excellent coatings for wood, paper, metal, plastics and glass. The blends are liquid and can be used without addition of solvent.

3,560,413

PROCESS FOR VULCANIZING AND FOAMING ACTIVE LIQUID DIOLEFIN POLYMERS

Douglas C. Edwards, Sarnia, Ontario, and Peter Noel Lewis, Calgary, Alberta, Canada, assignors to Polymer Corporation Limited, Sarnia, Ontario, Canada, a body corporate and body politic

No Drawing. Filed Jan. 12, 1968, Ser. No. 697,326
Claims priority, application Canada, Feb. 3, 1967, 981,925
Int. Cl. C08f *27/03, 47/10*
U.S. Cl. 260—2.5 **8 Claims**

A liquid polymer of an olefinically unsaturated compound, e.g. butadiene-1,3, the polymeric molecules of which have more than one active halogen atom, for example, two allylic bromides, is mixed with a small amount of an amine salt of an acid such as haloacetic acid or carbon dioxide to produce a homegeneous mixture and then the amine salt is decomposed whereby the mixture is foamed and vulcanized to produce a cellular vulcanizate. Triethylene tetramine trichloracetate salt is one of the amine salts which may be used.

3,560,414

PROCESS FOR PREPARING FOAMABLE BEADS

John J. Miskel, Jr., Ramsey, and Alfred J. Ackerman, Bloomingdale, N.J., assignors to Dart Industries Inc., a corporation of Delaware

No Drawing. Filed Feb. 9, 1968, Ser. No. 704,276
Int. Cl. C08f 47/10; C08j 1/26
U.S. Cl. 260—2.5 11 Claims

The process comprises coating beads of a polymer such as polystyrene with an organic agent, for example, zinc stearate, impregnating the coated beads with liquefied butane at conditions sufficient to maintain the butane in the liquefied state, removing the excess butane from the impregnated beads and recovering the resulting foamable beads. Coating the beads prevents bead agglomeration during the impregnation step.

3,560,415

CELLULAR POLYURETHANE PLASTICS

Gerhard Grögler and Erwin Windemuth, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany, a corporation of Germany

No Drawing. Filed Feb. 27, 1968, Ser. No. 708,502
Claims priority, application Germany, Feb. 28, 1967, F 51,654
Int. Cl. C08g 22/04, 22/16, 22/44
U.S. Cl. 260—2.5 8 Claims

Foam plastics based on compounds with reactive hydrogen atoms, organic polyisocyanates, and water as blowing agent by the single stage or multistage process, in which foaming with polyisocyanates and water takes place in the presence of compounds with at least one aziridine ring, the nitrogen atom of which is linked to a methylene group which may be alkylated or arylated, which aziridine compounds may already have a high molecular weight and which, at least in the cases where only one aziridine ring is present in the molecule, still have at least one hydrogen atom which is reactive with isocyanates.

3,560,416

HYDROPHILIC POLYURETHANE FOAMS

Joerg Sambeth and Alexis Archipoff, Carouge, Geneva, Switzerland, and Jean-Pierre Godechot, Paris, France, assignors to Elekal, Paris, France

No Drawing. Continuation-in-part of application Ser. No. 597,236, Nov. 28, 1966. This application June 27, 1969, Ser. No. 837,365
Int. Cl. C08g 22/44
U.S. Cl. 260—2.5 6 Claims

This specification discloses hydrophilic polyurethane foams. The foams are prepared by reacting a morpholine derivative containing an active hydrogen atom with the ingredients conventionally used to prepare polyurethane foams.

3,560,417

OFFSET AND LITHOGRAPHIC PRINTING PROCESS, MATERIAL FOR THE USE IN SAME, AND PROCESS FOR THE PREPARATION THEREOF

Philip A. Pizzi, Berlin, N.J., assignor to Jack P. Randall, Bronxville, N.Y., and Clarence P. Reberkenny, Cherry Hill, N.J., fractional part interest to each

No Drawing. Continuation-in-part of application Ser. No. 727,703, May 8, 1968. This application Mar. 13, 1969, Ser. No. 807,080
Int. Cl. B41n 1/00, 1/08
U.S. Cl. 260—8 17 Claims

A printing process including lithographic printing for printing on plastic, paper, metal foil and similar substrates to obtain improved multi-color fidelity is provided by the use of a print-receptive blank comprising a plastic support and a white "blanket" or coating comprising a titanium dioxide pigmented interpolymer of (a) units having carboxylate groups derived from a polymerizable carboxylic acid having α,β-unsaturation in a vinylidene group (b) units from at least one neutral, free-radical polymerizable ester having a vinylidene group attached to a functional group, and (c) units from at least one neutral, polymerizable monoxinylidene compound, in a formaldehyde stabilized colloid, e.g. gelatin.

3,560,418

STYRENE-ACRYLONITRILE COPOLYMERS AND PROCESS FOR THEIR PREPARATION

Joseph Matthew Kelley, Westfield, Walter F. Hanzl, Pompton Plains, and M Robert Stepanian, Rochelle Park, N.J., assignors to Dart Industries Inc., a corporation of Delaware

No Drawing. Filed June 12, 1968, Ser. No. 736,272
Int. Cl. B01f 17/32; C08f 1/11, 19/18
U.S. Cl. 260—17 2 Claims

A technique is herein provided for preparing clear, water white big styrene-acrylonitrile copolymer beads with low or negligible monomer concentration via a suspension polymerization process employing critical amounts of hydroxyethyl cellulose and an epoxy resin.

3,560,419

LIGHT STABILIZED ANTISTATIC POLYAMIDES

Lawrence W. Crovatt, Jr., Gulf Breeze, and Oscar A. Pickett, Jr., Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

No Drawing. Filed Jan. 10, 1969, Ser. No. 790,439
Int. Cl. C08g 51/54; C08k 1/66
U.S. Cl. 260—18 4 Claims

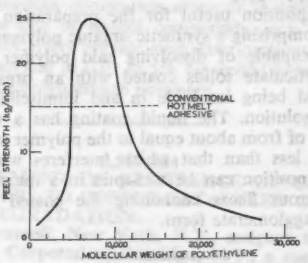
Tensile strength loss on exposure to light is reduced, in polycarbonamides containing between 0.1 and 20.0 weight percent polyalkoxylated triglyceride of a fatty acid containing from 10 to 30 carbon atoms, by adding from 0.005 to 4.0 weight percent of a trialkyl (C_6 to C_{18}) phosphine oxide.

3,560,420

HOT MELT ADHESIVE COMPRISING POLYETYLENE AND AN ETHYLENE-VINYL-ACETATE COPOLYMER

Toru Tamura and Shigeru Kondo, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 27, 1969, Ser. No. 837,027
Int. Cl. C08g 37/00; C09j 3/14, 3/26
U.S. Cl. 260—25 3 Claims



A thermoplastic hot melt adhesive characterized by high performance and low cost, is obtained by blending low molecular weight polyethylene, phenolic resin, abietic acid ester, terpene, resin, and ethylene-vinylacetate copolymer, such blend containing a homogeneous mixture of 30 to 60 weight percent of ethylene-vinylacetate copolymer which has 20 to 40 weight percent vinylacetate and which has a specific viscometric value from 0.6~0.90, 0 to 20 weight percent of phenolic resin which has a softening

temperature of 70 to 110° C., 5 to 20 weight percent of polyethylene which has molecular weight of from 5,000 to 10,000, 10 to 40 weight percent of abietic acid ester which has a softening temperature of 70 to 100° C., 5 to 30 weight percent of terpene resin which has a softening temperature of from 70 to 110° C., the remainder being mineral filler.

3,560,421

PROCESS FOR IMPROVING POLYAMIDE FILAMENT LUBRICITY

Paul R. Cox, Jr., and Lawrence W. Crovatt, Jr., Cary, N.C., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 593,713, Nov. 14, 1966. This application July 28, 1969, Ser. No. 845,544

Int. Cl. C08g *51/52;* **D01f** *1/02*

U.S. Cl. 260—28 **11 Claims**

The lubricity of polyamide filament can be substantially improved without significantly altering the appearance of the filaments by dispersing a small amount of a microcrystalline wax having a refractive index greater than 1.5 and less than 1.6 in the polyamide prior to its extrusion in filamentary form.

3,560,422

FAST TACK FORMULATION

Eugene R. Cox, Ponca City, Okla., assignor to Continental Oil Co., Ponca City, Okla., a corporation of Delaware

No Drawing. Filed Nov. 8, 1967, Ser. No. 681,580

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 **1 Claim**

Wax composition, having superior fast tack, comprising paraffin wax, ethylene-vinyl acetate copolymer, α-methyl styrene-vinyl toluene copolymer, and terpolymer of α-methyl styrene, vinyl toluene, and ethylhexyl acrylate.

3,560,423

LUSTER OF FIBERS CONTAINING SOLID PARTICULATE MATERIALS

Raymond Adrian Levesque, Joppatowne, Md., and Richard Frederick Schmidt, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Feb. 6, 1968, Ser. No. 703,260

Int. Cl. C08f *45/04, 45/24;* **C08g** *51/02*

U.S. Cl. 260—29.6 **9 Claims**

A composition useful for the preparation of shaped articles comprising a synthetic organic polymer, a solvent medium capable of dissolving said polymer, finely divided particulate solids coated with an organic liquid, said liquid being insoluble in and immiscible with the polymer solution. The liquid coating has a viscosity in the range of from about equal to the polymer solution viscosity to less than that which interferes with shaping. This composition can be wet-spun in a manner to produce lustrous fibers containing the coated particulate solids in agglomerate form.

3,560,424

SHRINK-PROOFING PROCESS

John H. Glaser, Waltham, and Basil Yankopoulos, Taunton, Mass., assignors to Amicon Corporation, Lexington, Mass.

No Drawing. Filed July 22, 1968, Ser. No. 746,250

Int. Cl. C08f *33/02, 45/54*

U.S. Cl. 260—29.6 **1 Claim**

A novel process, and the novel products produced thereby, wherein hydrogels of the type having not more than very limited covalent cross linking—and most advantageously no covalent cross-linking at all—are treated with ceric ion solution in an acid medium, and thereby made shrink resistant. The process is most suitable for use in shrink-proofing ionically-crosslinked materials like polyelectrolyte complex resins.

3,560,425

PARTICULATE BLEND OF POLYACRYLONITRILE AND A LATENT SOLVENT

Leon E. Wolinski, Buffalo, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 22, 1967, Ser. No. 692,692

Int. Cl. C08f *45/46*

U.S. Cl. 260—29.6 **3 Claims**

Dry blends of acrylonitrile polymer and a latent solvent such as dimethyl sulphoxide-ethylene glycol or dimethyl sulphoxide-water, the blends being melt extrudable.

3,560,426

COATING COMPOSITION OF AN AMINE TERMINATED PRECURSOR OF AN IMIDE POLYMER AND A MELAMINE RESIN

Paul L. Adesko, Mount Prospect, Ill., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 670,754, Sept. 26, 1967. This application July 16, 1968, Ser. No. 745,136

Int. Cl. C08g *37/30, 37/32, 51/44*

U.S. Cl. 260—30.2 **19 Claims**

A coating composition having a low viscosity particularly useful for wire coating which comprises: (A) an amine terminated aromatic polymeric precursor of an imide containing polymer which precursor is either a polyamic acid, a polyamide-amic acid, or a mixture thereof; and (B) a reactive melamine resin.

3,560,427

METHOD FOR CONSOLIDATING A PERMEABLE MASS

Cornelis Bezemer, Franciscus H. Meijs, and Marinus van Zanten, Rijswijk, Netherlands, and Clifford V. Wittenwyler, Union, N.J., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Division of application Ser. No. 690,400, Dec. 14, 1967, now Patent No. 3,476,189, which is a continuation-in-part of application Ser. No. 422,515, Mar. 24, 1965, now Patent No. 3,368,262. This application June 2, 1969, Ser. No. 829,728

Claims priority, application Great Britain, Mar. 26, 1964, 12,985/64, 12,986/64

Int. Cl. C08g *51/34*

U.S. Cl. 260—33.4 **4 Claims**

A method of consolidating formations using a resin-forming composition and a silane bonding agent having in the molecule at least one R—COO— radical bonded directly or indirectly to a Si atom and wherein R is an unsaturated aliphatic hydrocarbon.

3,560,428

PROCESS FOR PREPARING IMPROVED PHENYLENE POLYMER LACQUERS AND PRODUCTS

Norman Bilow, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif., a corporation of Delaware

No Drawing. Filed Sept. 5, 1967, Ser. No. 665,286

Int. Cl. C08g *33/00, 49/00;* **C09d** *3/60*

U.S. Cl. 260—33.8 **9 Claims**

Improved homogeneous phenylene lacquer and plastic compositions comprised of aromatic polymers of terphenyls, quaterphenyls, mixtures thereof, and mixtures

of the same with other aromatic monomer and phenyl material with not more than 5 aromatic rings copolymerized with an aromatic polymethylol compound such as polyoxyxylylene and an acid catalyst by an improved method of "A" stage polymerization therein in selective solvent combinations.

3,560,429

FERROCENE-XYLYLENE COPOLYMERS AND PROCESS

Norman Bilow, Los Angeles, Calif., and Harold Rosenberg, Dayton, Ohio, assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Mar. 6, 1969, Ser. No. 805,007
Int. Cl. C08f 45/04, 45/30
U.S. Cl. 260—33.8 12 Claims

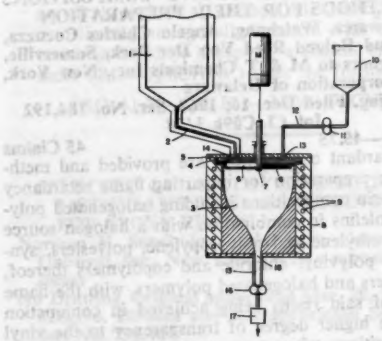
Thermosetting ferrocene-xylylene glycol copolymers and polyferrocenylene-xylylene glycol copolymers are prepared by reacting ferrocenyl compounds with xylylene glycol in the presence of a suitable catalyst. These copolymers can be molded and cured to structures of extremely high molecular weight by treatment with heat and pressure. The property of being thermosetting makes the copolymers of this invention useful in the fabrication of composite plastic structures.

3,560,430

PROCESS AND APPARATUS FOR MIXING A PIGMENT DISPERSION INTO A POLYAMIDE MELT

Ernst Meyer, Oberbruch, Rhineland, Wolfgang Grimm, Erlenbach, Klaus Gerlach, Obernau, and Helmut Linhart, Aschaffenburg, Germany, assignors to Glanzstoff AG, Wuppertal, Germany

Filed Nov. 20, 1968, Ser. No. 777,370
Claims priority, application Germany, Nov. 21, 1967, P 16 94 348.9
Int. Cl. B01f 3/12; C08g 51/02
U.S. Cl. 260—37 7 Claims



Process and apparatus for the uniform mixing of a polyamide melt with a pigment dispersed in a liquid medium soluble in the polyamide wherein the melt is divided, immediately after introduction of the liquid pigment dispersion as a thin liquid stream, into planar segments or displaced layers having a maximum thickness of about 1500 microns, preferably 20 to 850 microns, using a paddle wheel stirring mechanism at the inlet end of an elongated mixing vessel tapering radially inwardly down to its outlet or discharge end.

3,560,431

PREVENTION OF YELLOWING IN POLYAMIDES

Gene C. Weedon, 5431 Lingle Lane, Richmond, Va. 23234, and Joseph D. DeCaprio, 1004 Terrace Ave., Hopewell, Va. 23860

No Drawing. Filed July 9, 1968, Ser. No. 743,290
Int. Cl. C08g 51/56, 51/62
U.S. Cl. 260—45.7 6 Claims

The base color and yellowing tendency of polyamide material containing alkali metal iodides is substantially improved by combining therewith a trace amount of an alkali metal salt additive, such as sodium sulfite, sodium thiosulfate or a bisulfite addition compound of acetone or an appropriate aldehyde, the additive being introduced into the polyamide material or the surface of the material being contacted with a solute containing the alkali salt additive.

3,560,432

STABILISATION OF POLYMERS

Peter James Briggs, Eric Samuel Nicholson, and Vijay Ratna Sharma, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England, a corporation of Great Britain

No Drawing. Filed Mar. 14, 1968, Ser. No. 712,930
Claims priority, application Great Britain, Mar. 17, 1967, 12,565/67; Oct. 2, 1967, 44,779/67
Int. Cl. C08f 45/58, 45/60
U.S. Cl. 260—45.8 10 Claims

Polymers, especially polyolefines, are stabilized particularly against heat and oxidation, by the addition of mono or bis-(3,5-dialkyl-4-hydroxybenzyl)amines in combination with a triaryl phosphite, cyclic phosphite or monoester of phosphorous acid.

3,560,433

POLYURETHANES STABILIZED WITH PIPERIDINOSULFIDES

Isamu Suzuki and Kiyoshi Ichikawa, Fuji, and Keisuke Murayama and Syoji Morimura, Tokyo, Japan, assignors to Sanko Company Limited, Tokyo, and Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed June 5, 1969, Ser. No. 830,874
Claims priority, application Japan, June 8, 1968, 43/39,235
Int. Cl. C08g 51/58, 51/60
U.S. Cl. 260—45.8 8 Claims

This invention discloses the stabilization of polyurethane elastomers against deterioriations by light, heat and chlorine bleaching by incorporating therein at least one of piperidinosulfide compounds alone or in combination with at least one of phenol compounds, in a sufficient amount to effectively prevent such deteriorations, usually each in an amount of 0.01 to 5% by weight based on the amount of the polyurethane polymers.

3,560,434

ENHANCEMENT OF RESISTANCE OF OLEFIN POLYMERS TO COPPER-CATALYZED OXIDATIVE DEGRADATION

Charles Abramoff, New York, N.Y., assignor to Argus Chemical Corporation, Brooklyn, N.Y., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 739,636, June 25, 1968. This application Dec. 12, 1969, Ser. No. 884,711
Int. Cl. C08f 45/58, 45/60
U.S. Cl. 260—45.8 19 Claims

Compositions are provided which are useful in the enhancement of the resistance of olefin polymers to coppercatalyzed oxidative deterioration, consisting essentially of 3-amino-1,2,4-triazole and pentaerythritol, and optionally, at least one olefin polymer stabilizer. Olefin polymer compositions, such as propylene polymer compositions, containing such compositions, and a process for enhancing the

resistance of olefin polymers to copper-catalyzed degradation by incorporation of such compositions, are also provided.

3,560,435

METHOD OF POLYMERIZING ORGANOSILICON COMPOUNDS USING A NITRO CATALYST

Chi-Long Lee, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Oct. 24, 1968, Ser. No. 770,406
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 17 Claims

A method for polymerizing organosilicon compounds is disclosed. Cyclic organosilicon compounds, such as $[(CH_3)_2SiO]_3$, and a catalyst which is the reaction product of an aromatic organic compound having analiphatic carbon-carbon double bond and tetranitromethane are mixed. Silanol containing organosilicon compounds are polymerized by mixing them with the defined catalyst.

3,560,436

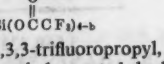
CURABLE COMPOSITION FROM CYCLIC POLYDIORGANOSILOXANE

John P. Szendrey, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed May 19, 1969, Ser. No. 825,968
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 10 Claims

A composition of $(R_2SiO)_a$,

and



where R is alkyl or 3,3,3-trifluoropropyl, R′ is a monovalent hydrocarbon or halogenated hydrocarbon radical, a is 3 or 4 and b is 0 or 1 is disclosed. The composition is stable in the absence of moisture but cures to a gelled material when exposed to moisture. The composition is useful as a rubbery material, a potting composition and as an encapsulant.

3,560,437

METHOD OF PREPARING POLYDIORGANOSILOXANE POLYMERS FROM CYCLIC POLYDIORGANOSILOXANES

John P. Szendrey, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed May 19, 1969, Ser. No. 825,969
Int. Cl. C08f *11/04*
U.S. Cl. 260—465 5 Claims

Cyclic polydiorganosiloxanes of the formula $(R_2SiO)_a$ where each R is an alkyl radical or 3,3,3-trifluoropropyl radical and a is 3 or 4 is mixed with perfluoroacetic anhydride at room temperature and thereafter exposed to moisture to provide polydiorganosiloxane endblocked with perfluoroacetoxy groups.

3,560,438

PREPARATION OF POLYBENZOXAZOLES AND POLYBENZTHIAZOLES

Charles D. Burton and Norman L. Madison, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed May 8, 1968, Ser. No. 727,737
Int. Cl. C08g *33/02*
U.S. Cl. 260—47 5 Claims

The present invention relates to heterocyclic polymers prepared by reacting 3,3′-dihydroxybenzidine or 3,3′-dimercaptobenzidine with a dialkyl or diaryl imidate or thioimidate compound in the presence of an acid reaction promoter and an inert carrier liquid.

3,560,439

SATURATED COPOLYESTER RESINS CONTAINING A MINOR AMOUNT OF STRUCTURAL UNITS DERIVED FROM 2 - HYDROXY - 5 - METHOXY ISOPHTHALIC ACID

John A. Price, Swarthmore, and Mary J. Stewart, Media, Pa., assignors to FMC Corporation, Philadelphia, Pa.

No Drawing. Filed Aug. 9, 1968, Ser. No. 751,373
Int. Cl. C08g *17/08*
U.S. Cl. 260—47 6 Claims

A highly polymeric linear copolyester made by the melt polymerization of reactants comprising: (a) an aromatic dicarboxylic acid or a lower alkyl di-ester thereof, (b) a diol, and (c) 2-hydroxy-5-methoxy isophthalic acid or a lower alkyl diester thereof.

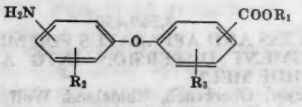
3,560,440

HIGH MOLECULAR WEIGHT LINEAR AROMATIC COPOLYAMIDES

Heinrich Gilch, Gerhard Darsow, and Ludwig Bottenbruch, Krefeld-Bockum, and Hermann Schnell, Krefeld-Uerdingen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 3, 1969, Ser. No. 813,278
Claims priority, application Germany, Apr. 13, 1968, P 17 70 203.3
Int. Cl. C08g *20/00*
U.S. Cl. 260—47 6 Claims

High molecular linear aromatic copolyamides by cocondensation of aminophenoxybenzoic acid esters of the general formula



wherein:

R_1 represents an alkyl or aryl radical and
R_2 and R_3 represent hydrogen, alkyl or aryl radicals,

together with equivalent amounts of aromatic diamines and aromatic dicarboxylic acids or with aromatic aminocarboxylic acids.

3,560,441

ANTIMONY TRIOXIDE INORGANIC COMPOUND GLASS FLAME RETARDANT COMPOSITIONS AND METHODS FOR THEIR PREPARATION

Morton Schwarcz, Watchung, Angelo Charles Cocuzza, Edison, and Roland Reed Van Der Beck, Somerville, N.J., assignors to M & T Chemicals Inc., New York, N.Y., a corporation of Delaware

No Drawing. Filed Dec. 16, 1968, Ser. No. 784,192
Int. Cl. C09k *3/28*
U.S. Cl. 260—45.75 45 Claims

Flame retardant compositions are provided and methods for their preparation for imparting flame retardancy to various resin compositions including halogenated polyolefins, polyolefins in combination with a halogen source such as polyethylene and polypropylene, polyesters, synthetic fibers, polyvinyl chloride and copolymers thereof, other polymers and halogenated polymers, with the flame retardancy of said resins being achieved in conjunction with a much higher degree of transparency to the vinyl resin compositions when transparent resin compositions are desired, and a much higher degree of true color by reducing interference between light and pigment when colored resin compositions are desired. The above is achieved by lowering the refractive index of an antimony trioxide flame retardant to more nearly coincide with a resin composition into which it may be introduced by forming an admixture of antimony trioxide with an inorganic salt in the ratio of 10:90 to 99:1, heating the admixture to a temperature of between about 650° C. and 1100° C. for a period of time sufficient to melt, rapidly cooling the melt to form glass, reducing the formed glass to a particle size within the range of 60 microns or less, and introducing the ground glass composition into

the resin composition to impart thereto flame retardancy while maintaining low opacity. Further, resin compositions containing the flame retardant compositions are provided and their method of preparation.

3,560,442

ORGANO-POLYSILOXANE COMPOSITIONS CONVERTIBLE INTO ELASTOMERS AT ROOM TEMPERATURE

Hans Dietrich Golitz, Cologne-Stammheim, Peter Schwabe, Leichlingen, and Walter Simmler, Odenthal-Schlinghofen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany, a corporation of Germany

No Drawing. Filed Oct. 1, 1968, Ser. No. 764,327
Claims priority, application Germany, Oct. 20, 1967, P 16 94 209.9
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 **11 Claims**

Novel cross-linking agents are disclosed which can be combined with plastically shapable organo-polysiloxanes; the resulting novel mixtures or compositions being storage stable under exclusion of all moisture. The cross-linking reaction takes place on exposure of the compositions to water, atmospheric humidity sufficing, at temperatures below 50° C. The compositions are especially adapted to be used for the filling of joints and as sealing materials in the building industry. The elastomers resulting therefrom have an increased adhesion to the substrate saving the expenditure of priming. The novel compositions comprise:

(A) an α,ω-dihydroxy-poly-(dimethyl-siloxane) which, in addition to its diorgano-siloxane units, may contain up to 10 mol-percent of siloxane units having the formula $CH_3SiO_{3/2}$, and may be admixed with fillers and an α,ω-bis-(trimethyl-siloxy) - poly - (dimethyl-siloxane); and

(B) a cross-linking agent having the formula

$$(RO—)_3Si—CH(R')—N(R'')—R'''$$

in which R is an alkyl radical with 1 to 4 carbon atoms; R' is a hydrogen atom, an alkyl radical with 1 to 6 carbon atoms or a phenyl radical; R'' is a hydrogen atom or a methyl radical; and R''' is a hydrogen atom, an alkyl, cycloalkyl, aminoalkyl, (methylamino)-alkyl or (dimethylamino)-alkyl radical with 1 to 6 carbon atoms in its alkyl group, or a radical having the formula $(RO—)_3SiCH(R')—$ or the formula

$$(RO—)_3Si—CH(R')—N(R'')—CH_2CH_2—$$

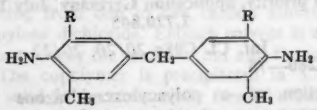
3,560,443

SELECTED 4,4' - METHYLENE BIS(2-ALKYL-6-METHYLANILINES) AS CURING AGENTS FOR EPOXY RESINS

Norman K. Sundholm, Middlebury, Conn., assignor to Uniroyal, Inc., New York, N.Y., a corporation of New Jersey

No Drawing. Original application Mar. 28, 1967, Ser. No. 626,396. Divided and this application Sept. 23, 1968, Ser. No. 798,484
The portion of the term of the patent subsequent to Dec. 2, 1986, has been disclaimed and dedicated to the Public
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 **4 Claims**

Epoxy resins are cured with 4,4'-methylenebis(2-alkyl-6-methylanilines) having the structural formula:



where R is an ethyl group or a secondary alkyl group having 3 to 6 carbon atoms.

3,560,444

HEAT REACTIVE MIXTURES OF BIS(HYDROCARBYLOXYALKYL) ESTERS OF AROMATIC TETRACARBOXYLIC ACIDS AND AROMATIC DIAMINES

Ralph E. De Brunner, Kettering, Ohio, assignor to Monsanto Research Corporation, St. Louis, Mo.

No Drawing. Original application June 30, 1966, Ser. No. 561,755. Divided and this application Sept. 9, 1968, Ser. No. 767,574
Int. Cl. C08g *20/32*
U.S. Cl. 260—65 **3 Claims**

Heat reactive mixtures of bis(hydrocarbyloxyalkyl) esters of aromatic tetracarboxylic acids and aromatic diamines, said mixtures being useful as coating and laminating compositions.

3,560,445

HIGH TEMPERATURE UNSATURATED POLYESTER

Frank Fekete, Monroeville, and John S. McNally, Arnold, Pa., assignors to Koppers Company, Inc., a corporation of Delaware

Filed June 5, 1967, Ser. No. 643,481
Int. Cl. C08f *21/02;* **C08g** *17/10*
U.S. Cl. 260—75 **9 Claims**

An unsaturated polyester, having excellent electrical and high temperature properties when copolymerized with a monomer such as styrene or vinyl toluene is formed by reacting 1,4-cyclohexane dimethanol and a second dihydric alcohol such as ethylene glycol or neopentyl gylcol with maleic anhydride and an unsaturated, hydrogenated aromatic dicarboxylic acid such as tetrahydrophthalic anhydride. The copolymerized polyester resin is useful in electrical applications as a replacement for wood, ceramics, and rubber materials or the like.

3,560,446

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT POLYIMIDES FROM URETHANES

Wilfried Zecher, Cologne-Stammhein, and Rudolf Merten, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed July 30, 1968, Ser. No. 748,591
Claims priority, application Germany, Aug. 7, 1967, F 53,161
Int. Cl. C08g *22/00*
U.S. Cl. 260—77.5 **7 Claims**

A process for the production of polyimides by reaction of carbamic acid esters and cyclic dicarboxylic acid anhydrides at temperatures of from 0 to 450° C.

3,560,447

METHOD FOR FORMING ELASTOMERIC PARTICLES AND PARTICLES PRODUCED THEREBY

Wallace Karl Bingham, Woodbury Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 377,114, June 22, 1964. This application Dec. 8, 1967, Ser. No. 688,956
Int. Cl. C08g *22/04, 53/02*
U.S. Cl. 260—77.5 **9 Claims**

Substantially infusible and insoluble elastomeric particles between 3 and 120 microns in size are formed by shearing

liquid precursor material in a liquid medium that provides conditions effective to convert the particles to the cured form; in a sepcific embodiment polyurethane particles are formed in an aqueous medium. One use for the particles is as a flatting agent in a paint composition.

3,560,448

SYNTHETIC POLYAMIDES

John Ewart Lodge, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Aug. 31, 1967, Ser. No. 664,640

Claims priority, application Great Britain, Sept. 13, 1966, 40,815/66

Int. Cl. C08g 20/00

U.S. Cl. 260—78 11 Claims

A linear fiber-forming copolyamide of the mixture of (1) an aliphatic diamine and an aliphatic dicarboxylic acid or (2) an aliphatic amino carboxylic acid with (3) a metal salt of 9,9-bis omega carboxy alkylfluorene mono or disulfonic acid and an aliphatic diamine.

3,560,449

INTERNAL ANTISTATIC AGENT FOR POLYAMIDE USE AND POLYAMIDE COMPOSITIONS HAVING IMPROVED ANTISTATIC PROPERTY

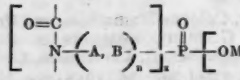
Hiroshi Kitagawa, Nagoya, Ataru Suwada, Hirakata-shi, and Satoyoshi Ohno, Kyoto, Japan, assignors to Toray Industries, Inc., Tokyo, and Sanyo Chemical Industries, Ltd., Kyoto, Japan

No Drawing. Filed Apr. 25, 1968, Ser. No. 724,219

Int. Cl. C08g 20/00

U.S. Cl. 260—78 4 Claims

An internal antistatic agent for synthetic polyamide use which comprises a compound which is a phosphoric ester of an addition product of (i) is carbonamide group-containing compound and (ii) an alkylene oxide of 2 to 3 carbon atoms, said compound containing a structural unit of the formula



wherein A stands for ethyleneoxide, B stands for propyleneoxide, $\{A,B\}_n$ stands for a homopolymer of ethyleneoxide or propyleneoxide or block or random copolymer of ethyleneoxide and propyleneoxide, n is an integer from 10 to 1000, x is 1 or 2, M is metals or hydrogen and y is 1 or 2, with the proviso that the sum of x and y is equal 3, and when x is 2, M is a metal and when x is 1, at least one of the M's is a metal.

3,560,450

LACTONE POLYMERIZATION PROCESS WITH PARTICULATE INITIATOR

Dario P. Curotti, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y., a corporation of Delaware

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,444

Int. Cl. C08g 17/017

U.S. Cl. 260—78.3 4 Claims

An improved process for the slurry polymerization of one or more β-propiolactones, at least 50% mole being pivalolactone, in a liquid hydrocarbon diluent in the presence of a solid carboxylate anion containing initiator which is either a preformed betaine or a "living" prepolymer, at least 80% by weight of the initiator possessing a particle size between 5 and 200 microns.

3,560,451

PLASTIC AND NONFLAMMABLE SULFUR COMPOSITION

Jean-Baptiste Signouret, Billiere, France, assignor to Societe Nationale des Petroles d'Aquitaine, Tour Aquitaine, Courbevoie, France, a corporation of France

No Drawing. Filed Feb. 12, 1968, Ser. No. 704,553

Claims priority, application France, Feb. 17, 1967, 95,305

Int. Cl. C08g 33/00

U.S. Cl. 260—79 7 Claims

A nonflammable plastic composition is obtained by melting together sulfur with three compounds which are: (1) a dithiophosphoric acid ester acrylic hydrocarbyls, (2) a vinyl-aryl hydrocarbon and (3) a polythiomethylene-alkanol resin, The three compounds are mixed with the molten sulfur separately or jointly, except that the ester (1) and the resin (3) are never added at the same time, and the moments of their addition are separated by a period of heating the mixture at 120° to 180° C.

3,560,452

PRODUCTION OF A PHENYL-SUBSTITUTED POLYACYLOXAMIDRAZONE

Ulrich Schulze, Elsenfeld, and Gerhard Meyer, Obernburg, Germany, assignors to Glanzstoff AG, Wuppertal, Germany

No Drawing. Filed July 2, 1969, Ser. No. 838,681

Claims priority, application Germany, July 10, 1968, P 17 70 846.2

Int. Cl. C08g 20/20, 20/22

U.S. Cl. 260—78 14 Claims

Production of a polyacyloxamidrazone bearing phenyl substitutents on the oxamidrazone portions of the linear polymer chain, the polymer being produced by reaction of N,N'-bis-(phenyl)-oxamidrazone with a dicarboxylic acid dichloride or dibromide in the presence of an acid acceptor. The resulting polycondensate exhibits valuable properties as a fiber-forming or film-forming product and is easily converted into the corresponding and more stable poly-bis(1,2,4-triazole) which is also phenyl-substituted.

3,560,453

PRODUCTION OF AN N-DIMETHYL-SUBSTITUTED POLYACYLOXAMIDRAZONE

Albert Schöpf, Hering, Odenwald, and Gerhard Meyer, Obernburg, Germany, assignors to Glanzstoff AG, Wuppertal, Germany

No Drawing. Filed July 7, 1969, Ser. No. 839,666

Claims priority, application Germany, July 10, 1968, 1,770,845

Int. Cl. C08g 20/20, 20/22

U.S. Cl. 260—78 9 Claims

Production of a polyacyloxamidrazone bearing a methyl group as a substituent on nitrogen atoms in the polymer chain, the polymer being produced by reaction

of N,N'-dimethyl oxalic acid bisamidrazone with a dicarboxylic acid dichloride or dibromide in the presence of an acid acceptor. The resulting polycondensate exhibits valuable properties as a fiber-forming or film-forming product.

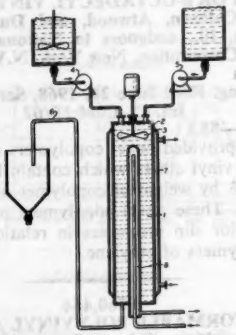
3,560,454

PROCESS FOR THE CONTINUOUS POLYMERIZATION AND COPOLYMERIZATION OF ETHYLENICALLY UNSATURATED COMPOUNDS

Robert Büning, Oberlar-Troisdorf, and Karl-Heinz Diessel, Nienburg (Weser), Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany, a corporation of Germany

Filed Dec. 16, 1968, Ser. No. 784,495
Claims priority, application Germany, Dec. 20, 1967, P 17 20 524.2
Int. Cl. C08f *1/62, 1/98*
U.S. Cl. 260—78.4 **14 Claims**

Improvements in the process for continuously polymerizing or copolymerizing in emulsion, ethylenically



unsaturated monomers using redox systems as catalysts comprising continuously polymerizing or copolymerizing the monomer or comonomers at a temperature of from 80° C. to −40° C. in an annular gap column having a mixing chamber arranged preceding the column, the suspension which is thereby obtained being removed continuously through an overflow apparatus.

3,560,455

PROCESS OF FORMING COPOLYMERS OF MALEIC ANHYDRIDE AND AN ALIPHATIC OLEFIN HAVING FROM 20 TO 30 CARBON ATOMS

Stanley M. Hazen, Cheswick, and William J. Heilman, Allison Park, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed May 26, 1969, Ser. No. 827,920
Int. Cl. C08f *1/08*
U.S. Cl. 260—78.5 **8 Claims**

Maleic anhydride and an aliphatic olefin having from 20 to 30 carbon atoms, such as a mixture of alpha-olefins having from 20 to 30 carbon atoms, are copolymerized in the presence of a free-radical catalyst and a solvent such as a saturated dihalogenated aliphatic liquid hydrocarbon having from one to five carbon atoms, for example propylene dichloride. Enough solvent is employed to solubilize not only the reactants but also the copolymer products. The copolymer is precipitated in a filterable particulate solid form substantially free of monomers by cooling the entire reaction product to a temperature from about 35° C. to about 55° C. and admixing the cooled reaction product with an aliphatic monohydroxy alcohol having three carbon atoms per molecule, such as n-propanol, while maintaining the desired cool temperature.

3,560,456

PROCESS OF FORMING COPOLYMERS OF MALEIC ANHYDRIDE AND AN ALIPHATIC OLEFIN HAVING FROM 16 TO 18 CARBON ATOMS

Stanley M. Hazen, Cheswick, and William J. Heilman, Allison Park, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed May 26, 1969, Ser. No. 827,921
Int. Cl. C08f *1/08*
U.S. Cl. 260—78.5 **8 Claims**

Maleic anhydride and an aliphatic olefin having from 16 to 18 carbon atoms, such as 1-octadecene, are copolymerized in the presence of a free radical catalyst and a solvent such as a saturated dihalogenated aliphatic liquid hydrocarbon having from one to five carbon atoms, for example, propylene dichloride. Enough solvent is employed to solubilize not only the reactants but also the copolymer products. The copolymer is precipitated in a filterable particulate solid form by admixing the entire reaction product with an aliphatic monohydroxy alcohol having three carbon atoms, such as n-propanol.

This invention relates to the preparation of a copolymer of maleic anhydride and an aliphatic olefin having from 16 to 18 carbon atoms per molecule in a particulate solid form.

3,560,457

PROCESS OF FORMING COPOLYMERS OF MALEIC ANHYDRIDE AND AN ALIPHATIC OLEFIN HAVING FROM 12 TO 14 CARBON ATOMS

Stanley M. Hazen, Cheswick, and William J. Heilman, Allison Park, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed May 26, 1969, Ser. No. 827,922
Int. Cl. C08f *1/08*
U.S. Cl. 260—78.5 **8 Claims**

Maleic anhydride and an aliphatic olefin having from 12 to 14 carbon atoms, such as 1-dodecene, are copolymerized in the presence of a free radical catalyst and a solvent such as a saturated dihalogenated aliphatic liquid hydrocarbon having from one to five carbon atoms, for example, propylene dichloride. Enough solvent is employed to solubilize not only the reactants but also the copolymer products. The copolymer is precipitated in a filterable particulate solid form by admixing the entire reaction product with an aliphatic monohydroxy alcohol having from three to four carbon atoms, such as n-propanol and n-butanol.

3,560,458

PROCESS FOR POLYMERIZATION OF CATIONICALLY POLYMERIZABLE MONOMERS

Joseph P. Kennedy, Cranford, and Francis P. Baldwin, Summit, N.J., assignors to Esso Research and Engineering Company, a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 364,295, May 1, 1964. This application Mar. 13, 1968, Ser. No. 712,605
Int. Cl. C08d *3/02*
U.S. Cl. 260—85.3 **15 Claims**

A catalyst system for preparing homopolymers and copolymers of cationically polymerizable monomers wherein the catalyst system comprises an organic halide cocatalyst and a cationic catalyst of the type $Al(M)_2R$, where M is a branched or straight-chain C_1 to C_{12} alkyl and R is M, hydrogen or halogen.

3,560,459

CATALYST SYSTEM AND PROCESS FOR PREPARING POLYMERS FROM CATIONICALLY POLYMERIZABLE MONOMERS

Joseph P. Kennedy, Cranford, N.J., assignor to Esso Research and Engineering Company, a corporation of Delaware

No Drawing. Filed Apr. 14, 1969, Ser. No. 816,058
Int. Cl. C08d *1/14, 3/04, 3/06*
U.S. Cl. 260—85.3 19 Claims

A catalyst is prepared by reacting alkyl aluminum dihalide, in the absence of a hydrocarbon solvent, with a cobalt salt to form a blue liquid complex. The catalyst so formed may be used to prepare highly unsaturated polymers and copolymers of cationically polymerizable monomers.

The polymers of this invention are rubbery high molecular weight materials. The preferred monomers are isobutylene and isoprene. The preferred alkyl aluminum halide is aluminum ethyl dihalide and the preferred cobalt salts are $CoCl_2$, cobalt bromide and cobalt acetonyl acetonate.

3,560,460

POLYMERIZATION OF VINYL CHLORIDE AND VINYL ACETATE TO MAKE A RESIN PRODUCT

Carlisle W. Gilbert, Mount Lebanon Township, Allegheny County, Pa., assignor to Blaw-Knox Company, Pittsburgh, Pa., a corporation of Delaware

Filed July 24, 1968, Ser. No. 747,227
Int. Cl. C08f *15/24, 3/50, 3/22*
U.S. Cl. 260—87.1 16 Claims

This application discloses a method and apparatus for the continuous polymerization of vinyl chloride with other monomers in the manufacture of thermoplastic resins wherein the monomers are combined with a solvent and the mixture forced at a predetermined slow rate through a long tubular reactor at constantly controlled pressure and temperature conditions. The polymer, upon discharge from the reactor, is stripped of the solvent and any remaining monomer or other volatile, while the polymer is being formed into a homogenous solid, as by extrusion or drum drying. Generally it is then pulverized to the form in which it is commercially sold. Usually a catalyst is added to the monomer solvent mixture before the mixture enters the reactor.

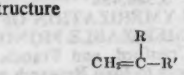
3,560,461

METHOD OF SAPONIFYING VINYL ACETATE COPOLYMERS

Kiyoshi Yonezu, Kinichi Nishioka, and Kazuo Mukumoto, Kurashiki, Japan, assignors to Kurashiki Rayon Co., Ltd., Okayama Prefecture, Japan

No Drawing. Filed Nov. 29, 1966, Ser. No. 597,570
Claims priority, application Japan, Dec. 4, 1965, 40/74,715
Int. Cl. C08f *27/14*
U.S. Cl. 260—87.3 7 Claims

Polymers of ethylene, vinyl acetate and a monomer having the structure



wherein R is selected from the group consisting of hydrogen and methyl and R′ is selected from the group consisting of —COOR″, —C_6H_5, —Cl, —CN, —CH_3 and —CH=CH_2, and R″ represents hydrogen or lower alkyl, the mole ratio of ethylene to vinyl acetate and the monomer being in the range of about 0.5:1 to 9:1 and the mole ratio of the monomer to vinyl acetate being in the range of about 0:1 to 0.1:1 are saponified by contacting in a reaction tower maintained under saponification reaction conditions a solution of the polymer and a basic catalyst countercurrently with alcohol vapor in an amount sufficient to effect saponification and remove from the reaction tower as overhead acetic acid ester formed as a result of the saponification reaction.

3,560,462

VINYL CHLORIDE COPOLYMERS AND PROCESS FOR PREPARING SAME

Elliott Farber, Trenton, and Marvin Koral, Warren, N.J., assignors to Tenneco Chemicals, Inc., a corporation of Delaware

No Drawing. Filed Sept. 15, 1967, Ser. No. 668,218
Int. Cl. C08f *15/00*
U.S. Cl. 260—87.5 8 Claims

The rate of polymerization of vinyl chloride can be controlled by incorporating in it a small amount of a long chain α-olefin. The resulting copolymers, which are characterized by excellent processability and other valuable properties, are of particular value in the production of compositions that are to be used as floor coverings, wall coverings, shoe soles and heels, and the like.

3,560,463

COPOLYMERS OF ETHYLENE WITH CETYL VINYL ETHER OR n-OCTADECYL VINYL ETHER

Samuel E. Colburn, Atwood, and Duane K. Bryant, Charleston, Ill., assignors to National Distillers and Chemical Corporation, New York, N.Y., a corporation of Virginia

No Drawing. Filed June 26, 1968, Ser. No. 740,031
Int. Cl. C08f *15/02*
U.S. Cl. 260—88.1 3 Claims

There are provided novel copolymers of ethylene with certain alkyl vinyl ethers which contain between about 5 to about 10% by weight of copolymer of the alkyl vinyl ether moiety. These novel copolymers provide materials having superior slip properties in relation to previously known copolymers of ethylene.

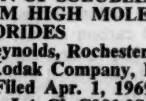
3,560,464

MELT-FORMABLE POLYVINYL ALCOHOLS

Kentaro Toyoshima, Saburo Imoto, Hirosaburo Mori, Osamu Ohara, Hiroshi Harima, and Shunji Miyake, Kurashiki-shi, and Taiji Ozaki, Takatsuki-shi, Japan, assignors to Kuraray Co., Ltd., Okayama Prefecture, Japan, a corporation of Japan

No Drawing. Filed Sept. 29, 1966, Ser. No. 583,077
Claims priority, application Japan, Oct. 11, 1965, 40/62,239
Int. Cl. C08f *3/34*
U.S. Cl. 260—91.3 1 Claim

A method is disclosed by which polyvinyl alcohol moldings are formed. A polyvinyl alcohol having about 4 to 15 mol percent of side chain alkyl groups of about 4 to 20 carbon atoms, based on the total number of carbon atoms in the main polymer chain having substituents other than hydrogen, is melt extruded into a shaped product. The side chain may have the structure —OR,



—R, wherein R and R′ are alkyl.

3,560,465

PREPARATION OF SOLUBLE POLY(VINYL ESTERS) FROM HIGH MOLECULAR WEIGHT ACID CHLORIDES

George A. Reynolds, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,380
Int. Cl. C08f *27/12*
U.S. Cl. 260—91.3 10 Claims

A process is described for preparing soluble poly(vinyl esters) from poly(vinyl alcohol) and high molecular weight acid chlorides. This procedure is especially useful for preparing light-sensitive polymers.

3,560,466

ISOLATION OF CHEMICAL REACTANTS

Geir Bjornson, Bartlesville, Okla., assignor to Phillips Petroleum Company, a corporation of Delaware

No Drawing. Filed Apr. 4, 1966, Ser. No. 539,629
Int. Cl. C08f *1/62, 3/26*
U.S. Cl. 260—92.1 4 Claims

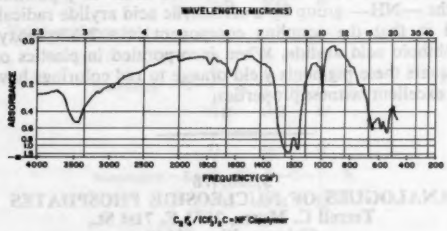
A new and improved process for carrying out a chemical reaction comprising the encapsulation of at least one of the components in at least one body of ice to prevent the prereaction between that component and any of the other components until at least the time when all remaining componens are charged into the reaction zone.

3,560,467

COPOLYMERS OF PERFLUOROISOPROPYLIDENIMINE WITH TETRAFLUOROETHYLENE

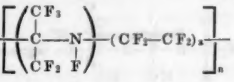
Robert A. Falk, Rockaway, N.J., assignor to Thiokol Chemical Corporation, Bristol, Pa., a corporation of Delaware

Filed Nov. 7, 1968, Ser. No. 774,160
Int. Cl. C08g *33/02*
U.S. Cl. 260—92.1 11 Claims



$C_3F_5(CF_2)_xC{=}NF$ Copolymer

Perfluoroisopropylidenimine and tetrafluoroethylene are copolymerized by irradiation with gamma rays. The copolymer has a molecular weight of at least about 1400 and a molecular structure which consists predominantly of polytetraethylene groups and may be represented by the formula



wherein x and n are integers greater than 1. The copolymer melts to a free-flowing liquid and is useful for making plastic articles by extrusion or injection molding means.

3,560,468

SUSPENSION POLYMERISATION OF STYRENE

James Keith Hambling, Frimley, near Aldershot, Colin Temple Richards, Old Windsor, and John Mansel Squire, Thorpe, England, assignors to The British Petroleum Company Limited, London, England, a corporation of England

No Drawing. Filed Mar. 5, 1968, Ser. No. 710,677
Claims priority, application Great Britain, Mar. 8, 1967, 10,826/67
Int. Cl. C08f *7/04*
U.S. Cl. 260—93.5 4 Claims

Olefinically unsaturated monomers, particularly styrene, are polymerised in aqueous suspension by a process which comprises reacting an alkyl hydroperoxide, e.g., tert butyl hydroperoxide with a hydroxy acid of sulphur which possesses reducing properties or a salt of such an acid, e.g., sodium formaldehyde sulphoxylate, in water, subsequently adding a suspending agent, monomer and catalyst, and polymerising the monomer.

3,560,469

PROCESS FOR POLYMERIZING STYRENE

Raymond Plepys and Richard Waack, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,817
Int. Cl. C08f *7/04*
U.S. Cl. 260—93.5 6 Claims

An improved process for the anionic polymerization of styrene using polysiloxanes as promoters in the polymerization reaction and as agents for controlling the molecular weight of the polymer in alkylbenzene solvents.

3,560,470

CRYSTALLINE POLYMER NUCLEATION

Harold V. Wood and William O. Drake, Bartlesville, Okla., assignors to Phillips Petroleum Company, a corporation of Delaware

No Drawing. Filed Dec. 22, 1967, Ser. No. 692,659
Int. Cl. C08f *29/02*
U.S. Cl. 260—93.7 1 Claim

Crystalline polymer compositions are improved with respect to physical properties by the inclusion therein of a nucleating amount of 5-benzylidene-2-thiohydantoin.

3,560,471

PROCESS FOR DEASHING POLYMERS

Joseph Di Pietro, West Millington, N.J., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Continuation of application Ser. No. 597,576, Nov. 29, 1966. This application Oct. 10, 1969, Ser. No. 866,148
Int. Cl. C08f *3/02, 3/06, 3/10*
U.S. Cl. 260—93.7 6 Claims

The deashing of polymers, and in particular polyolefins, by means of treatment with secondary and tertiary organic phosphites.

3,560,472

METHOD OF TREATING MOLECULAR SIEVES

Arnaud M. J. de Gramont, Saint-Adresse, Seine-Maritime, and Lucien G. Choquet, Le Havre, Seine-Maritime, France, assignors to Compagnie Francaise de Raffinage, Paris, France

No Drawing. Filed Jan. 30, 1969, Ser. No. 795,363
Claims priority, application France, Jan. 31, 1968, 138,104
Int. Cl. C07c *11/08*; C08d *3/06, 3/10*
U.S. Cl. 260—94.2 6 Claims

A method of treating molecular sieves has been provided whereby the polymerizing and isomerizing properties of the sieves are substantially reduced. According to this method, the sieves are first contacted with a mixture containing at least one diolefin with conjugated double bonds under conditions in which a part of the diolefin is polymerized onto the surfaces of the molecular sieves and then the thus treated sieves are contacted with an olefin which is sought to be purified.

3,560,473

PROCESS FOR POLYMERIZING ISOPRENE

Augusto Bonfardeci and Lido Porri, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed Sept. 18, 1968, Ser. No. 760,729
Claims priority, application Italy, Sept. 19, 1967, 20,610/67
Int. Cl. C08d *3/10*
U.S. Cl. 260—94.3 8 Claims

Isoprene is polymerized to high molecular weight polyisoprene having substantially cis-1,4 structure practically identical with that of natural rubber, using ternary

catalytic systems prepared from titanium tetra-alkoxides, organometallic compounds of aluminum, and a silicon compound.

3,560,474

METHOD OF POLYMERIZATION OF ISOBUTYLENE UTILIZING $AlBr_3$ OR AlI_3 WITH AN ACTIVATING COMPOUND

Miroslav Chmelíř and Miroslav Marek, both of 23 Vratislavova, Prague 2, Czechoslovakia

No Drawing. Continuation-in-part of application Ser. No. 703,882, Feb. 8, 1968, which is a continuation-in-part of application Ser. No. 621,454, Mar. 8, 1967. This application May 14, 1969, Ser. No. 824,660

Claims priority, application Czechoslovakia, Mar. 11, 1966, 1,652/66

Int. Cl. C08f *3/14*

U.S. Cl. 260—94.8 **7 Claims**

Isobutylene is polymerized rapidly in the presence of aluminum bromide or aluminum iodide as a catalyst and in the simultaneous presence of an activating compound such as $TiCl_4$, $TiBr_4$, VCl_4, $SbCl_5$, $SnCl_4$, $GaCl_3$, BF_3 or BrI even if the amount of the activating compound is too small to cause polymerization on its own in the absence of a co-catalyst which forms a Lewis acid with the activating compound, and if the polymerization zone is free from such a co-catalyst. $AlBr_3$ or AlI_3 is consumed during polymerization, thus permitting the polymerization to be controlled by gradual addition of minute amounts of the aluminum halide.

3,560,475

PROTHROMBIN COMPLEX PREPARED BY PRECIPITATION WITH POLYETHYLENE GLYCOL

Lajos F. Fekete, Valinda, and Edward Shanbrom, Santa Ana, Calif., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Filed June 19, 1969, Ser. No. 834,883

Int. Cl. C07g *7/00*

U.S. Cl. 260—112 **7 Claims**

A prothrombin complex prepared from a plasma fraction containing Factors II, VII, IX and X by adsorption with tribasic calcium phosphate, elution with trisodium citrate, and multiple precipitations with polyethylene glycol.

3,560,476

BASIC MONOAZO AND DISAZO DYES CONTAINING HYDROXYETHYL HYDRAZINIUM GROUPS

Roland Entschel and Curt Mueller, Basel, and Walter Wehrli, Riehen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

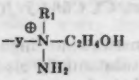
No Drawing. Continuation-in-part of applications Ser. No. 188,837, Apr. 19, 1962, now Patent No. 3,252,965, Ser. No. 188,889, Apr. 19, 1962, now Patent No. 3,252,967, Ser. No. 250,787, Ser. No. 250,788, and Ser. No. 250,789, all Jan. 11, 1963, Ser. No. 300,068, Aug. 5, 1963, Ser. No. 306,306, and Ser. No. 306,321, both Sept. 3, 1963, Ser. No. 344,557, Feb. 13, 1964, and Ser. No. 610,718, Jan. 20, 1967. This application June 26, 1967, Ser. No. 648,962

Claims priority, application Switzerland, Apr. 21, 1961, 4,709/61; Jan. 12, 1962, 359/62; Apr. 24, 1962, 4,709/62; May 3, 1963, 5,588/63; Jan. 16, 1964, 479/64; Feb. 7, 1964, 1,482/64

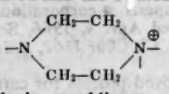
Int. Cl. C09b *29/36, 45/48;* **D06p** *1/02*

U.S. Cl. 260—152 **7 Claims**

Basic dyes of the monoazo and disazo series containing at least one hydrazinium group of the formula:



connected to a dye radical A, wherein R_1 is methyl, ethyl or hydroxymethyl or, together with the bridge member *y* and the dye radical A and the N-atom bound to R_1, is:



are excellent for dyeing, padding or printing Orlon and related materials.

3,560,477

PHENYL-AZO-NAPHTHOIC ACID ARYLIDE PIGMENTS

Rudolf Mory, Dornach, and Willy Mueller, Riehen, Switzerland, assignors to Ciba Limited, Basel, Switzerland, a company of Switzerland

No Drawing. Filed Feb. 28, 1967, Ser. No. 619,165

Claims priority, application Switzerland, Mar. 23, 1966, 4,191/66

Int. Cl. C07c *107/04;* **C09b** *29/20*

U.S. Cl. 260—203 **9 Claims**

The present invention concerns monoazo dyestuff pigments. They are characterized in that the diazo component is a 3-amino-4-carbalkoxy-benzoic acid anilide, the anilide radical of which is substituted in m- or p-position to the —NH— group by a carboxylic acid arylide radical, and in that the coupling component is a 2,3-hydroxynaphthoic acid arylide. When incorporated in plastics or lacquers these pigments yield orange to red colorings having excellent fastness properties.

3,560,478

ANALOGUES OF NUCLEOSIDE PHOSPHATES

Terrell C. Myers, 2571 E. 71st St., Chicago, Ill. 60649

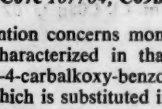
No Drawing. Continuation-in-part of application Ser. No. 526,041, Feb. 9, 1966. This application June 14, 1968, Ser. No. 746,723

Int. Cl. C07d *51/52, 51/54*

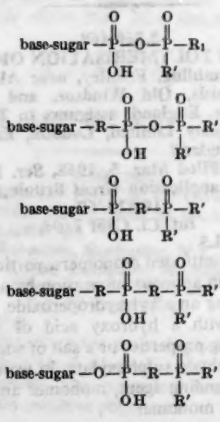
U.S. Cl. 260—211.5 **3 Claims**

Phosphonate derivatives of base-sugar phosphates having the formulae:

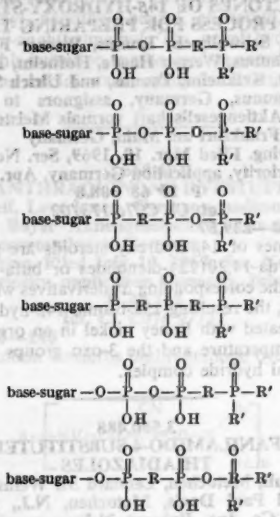
Monophosphonates:



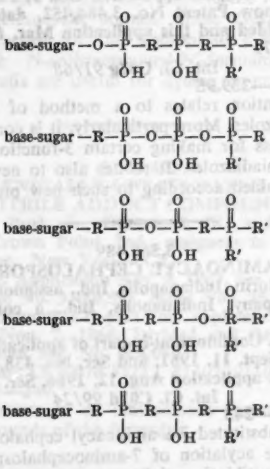
Diphosphonates:



Triphosphonates:



Triphosphonates:



in which at least one of the R' groups is selected from the group consisting of R'' and OR'' in which R'' is a monovalent organic group selected from the group consisting of a lower aliphatic group and halogen derivatives thereof, a fatty acid group and halogenated derivatives thereof, an aryl group and halogenated derivatives thereof, an alkaryl group and halogenated derivatives thereof, a heterocyclic group and a base sugar group and in which the base is selected from the group consisting of a purine base and a pyrimidine base.

3,560,479

FIRE-RETARDANT CELLULOSIC COMPOSITIONS

Kailash Chandra Pande, Farmingdale, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

No Drawing. Filed Oct. 21, 1969, Ser. No. 868,215
Int. Cl. C08b *23/00, 27/66, 27/68*
U.S. Cl. 260—212 **6 Claims**

A flame-retardant composition comprised of a cellulosic composition and a bis-β,β-(dialkylphosphono) propionic acid derivative integrally attached to the cellulosic polymer chain of the cellulosic composition.

3,560,480

PROCESS FOR MAKING ANIONIC WATER-SOLUBLE POLYSACCHARIDES

Emilio Kruger, Milan, Italy, assignor to Cartiera Di Cairate S.p.A., Milan, Italy

No Drawing. Filed June 17, 1969, Ser. No. 834,140
Int. Cl. C08b *25/02, 29/14*
U.S. Cl. 260—231 **4 Claims**

A process for obtaining anionic water soluble polysaccharides by introducing acid groups into the polysaccharides chain in an anhydrous solvent is described. The derivatised polysaccharides have good film forming properties and can be used as additives in the paper industry.

3,560,481

PHARMACEUTICALLY ACTIVE AZATRICYCLIC CARBOXAMIDES

Gilbert H. Berezin, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Filed Nov. 12, 1968, Ser. No. 775,114
Int. Cl. C07d *41/00*
U.S. Cl. 260—239 **2 Claims**

This invention relates to the novel compounds 4-azatricyclo[4.3.1.$1^{3,8}$]undecane - 4 - carboxamide and 4-azatricyclo[4.3.1.$1^{3,9}$]dodecane - 4 - carboxamide, the methods of preparing same and novel intermediates formed in their preparation. These compounds are useful as antiviral agents.

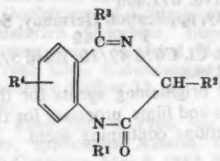
3,560,482

METHOD FOR PRODUCING BENZODIAZEPINE DERIVATIVES

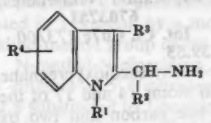
Hisao Yamamoto, Nishinomiya-shi, Shigeho Inaba, Takarazuka-shi, Tadashi Okamoto, Ashiya-shi, Toshiyuki Hirohashi, Kobe, Kikuo Ishizumi, Minoo-shi, Michihiro Yamamoto, Takarazuka-shi, Isamu Maruyama, Minoo-shi, Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,207
Claims priority, application Japan, Dec. 8, 1967, 42/78,906; Dec. 9, 1967, 42/79,161; Dec. 12, 1967, 42/79,921, 42/79,922; Apr. 25, 1968, 43/28,172
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 **4 Claims**

Benzodiazepine derivatives of the formula,



wherein R^1 and R^2 are respectively hydrogen or alkyl; R^3 is cycloalkyl, unsubstituted or alkyl- or halogen-substituted pyridyl, furyl or thienyl, etc. and R^4 is hydrogen, halogen, nitro, alkyl, alkoxy, haloalkyl or alkylsulfonyl, which have excellent tranquilizing effect are produced by reacting a 2-aminomethylindole derivative of the formula,



wherein R^1, R^2, R^3 and R^4 have the same meanings as defined above or a salt thereof, with an oxidizing agent.

3,560,483

1,4-DIALKYL-3,6-DIPHENYLEPI(THIO, DITHIA OR TETRATHIA)-2,5-PIPERAZINEDIONES

Steve George Svokos, Westwood, N.J., and Robert Bruce Angier, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn., a corporation of Maine

No Drawing. Filed June 13, 1969, Ser. No. 833,147

Int. Cl. C07d *93/36*

U.S. Cl. 260—239.3 9 Claims

This disclosure describes compounds of the class of 1,4-dialkyl-3,6-diphenylepi(thia, dithia or tetrathia)-2,5-piperazinediones useful as antifungal and antiviral agents.

3,560,484

PROCESS FOR THE PREPARATION OF ε-CAPROLACTAM

Ikuzo Tanaka, Hideo Uehara, Hukue Osaki, and Masayuki Yamagata, Tokyo, Japan, assignors to Teijin Limited, Osaka, Japan, a corporation of Japan

No Drawing. Filed June 17, 1969, Ser. No. 834,173

Claims priority, application Japan, June 21, 1968, 43/42,971; Aug. 1, 1968, 43/54,498, 43/54,499; Nov. 4, 1968, 43/80,545; Nov. 5, 1968, 43/81,166

Int. Cl. C07d *41/06*

U.S. Cl. 260—239.3 11 Claims

ε-Caprolactam is prepared in a single step without formation of by-product ammonium sulfate by contacting 2-nitrocyclohexanone and/or 2-nitrocyclohexen-1-ol with hydrogen at a temperature ranging from 150° to 300° C. in the presence of a liquid medium such as water, alcohols, ethers, benzene or mixtures thereof and of an active hydrogenation catalyst, preferably in the further presence of a nitrogen-containing basic substance such as ammonia.

This invention relates to a novel process for the preparation of ε-caprolactam.

3,560,485

Δ_2-PYRAZOLINE OPTICAL BRIGHTENERS

Erich Schinzel, Frankfurt am Main, Siegfried Bildstein, Keekheim, Taunus, and Karl Heinz Lebkucher, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany, a corporation of Germany

No Drawing. Continuation of application Ser. No. 490,112, Sept. 24, 1965. This application Sept. 29, 1967, Ser. No. 671,606

Claims priority, application Germany, Sept. 25, 1964, F 44,060

Int. Cl. C07d *49/10;* B44d *5/00*

U.S. Cl. 260—239.8 6 Claims

Novel optical brightening agents for the treatment of fibrous materials and films, processes for their use and detergent compositions containing them.

3,560,486

PREGNANE DERIVATIVES

Arthur F. Marx and Dirk van der Sijde, Delft, Netherlands, assignors to Koninklijke Nederlandsche Gist- en Spiritusfabriek N.V., Delft, Netherlands

No Drawing. Filed Mar. 13, 1968, Ser. No. 712,600

Claims priority, application Netherlands, Mar. 13, 1967, 6703781

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 71 Claims

New 14α,17α-methylenedioxypregnane derivatives are provided wherein atoms 14 and 17 of the steroid skeleton are bridged by one carbon and two oxygen atoms, arranged in such a way that they form a 1,3-dioxane ring system with carbon atoms 13, 14 and 17 of the steroid skeleton.

3,560,487

17β-LACTONES OF 14β-HYDROXY-STEROIDS AND PROCESS FOR PREPARING THEM

Hans Kohl, Schwalbach, Taunus, Werner Fritsch, Neuenhain, Taunus, Werner Haede, Hofheim, Taunus, Kurt Radscheit, Kelkheim, Taunus, and Ulrich Stache, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister, Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 19, 1969, Ser. No. 808,689

Claims priority, application Germany, Apr. 27, 1968, P 17 68 308.8

Int. Cl. C07c *173/02*

U.S. Cl. 260—239.57 2 Claims

17β-lactones of 14β-hydroxy steroids are prepared by reacting carda-14,20(22)-dienolides or bufa-14,20,22-trienolides or the corresponding Δ^4-derivatives with N-bromo acyl amides, the resulting 15α-bromo-14β-hydroxy derivatives are treated with Raney nickel in an organic solvent at room temperature and the 3-oxo groups are reduced with a metal hydride complex.

3,560,488

3-SULFANILAMIDO-4-SUBSTITUTED-1,2,5-THIADIAZOLES

Roger J. Tull, Metuchen, Leonard M. Weinstock, Rocky Hill, and Paul Davis, Metuchen, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original application Oct. 1, 1964, Ser. No. 400,894, now Patent No. 3,484,452, dated Dec. 16, 1969. Divided and this application Mar. 6, 1969, Ser. No. 816,471

Int. Cl. C07g *91/68*

U.S. Cl. 260—239.95 2 Claims

This invention relates to a method of synthesizing 1,2,5-thiadiazoles. More particularly, it is concerned with a new process for making certain 3-functionally substituted-1,2,5-thiadiazoles. It relates also to new 1,2,5-thiadiazoles obtained according to such new process.

3,560,489

7-α-AMINOACYL CEPHALOSPORINS

Robert B. Morin, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind., a corporation of Indiana

No Drawing. Continuation-in-part of applications Ser. No. 137,000, Sept. 11, 1961, and Ser. No. 438,038, Mar. 8, 1965. This application Aug. 12, 1966, Ser. No. 571,966

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 15 Claims

Certain substituted 7-α-aminoacyl cephalosporins, prepared by the acylation of 7-aminocephalosporanic acid, having high antibiotic activity.

3,560,490

TRIFLUOROMETHYL FURAN DERIVATIVES

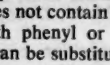
Kenneth K. Wyckoff, David M. Tennent, and Ronald E. Bambury, Ashland, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 482,907, Aug. 26, 1965, now Patent No. 3,405,163, Ser. No. 493,534, Oct. 6, 1965, now Patent No. 3,442,913, and Ser. No. 493,535, Oct. 6. 1965, now Patent No. 3,439,000. This application Feb. 28, 1966, Ser. No. 530,316

Int. Cl. C07d *5/26*

U.S. Cl. 260—240 20 Claims

Novel hydrazone and oxime derivatives of 5-trifluoromethylfurans. The hydrazone or oxime group can be in either the 2- or 3-position of the furan ring. The 2- or 3-position which does not contain a hydrazone or oxime can be substituted with phenyl or naphthyl. The 4-position of the furan ring can be substituted with an ester group of the formula



$$-\overset{O}{\overset{\|}{C}}-O-R$$

wherein R is (lower) alkyl, cycloakyl of 3 to 6 carbon atoms, phenyl, naphthyl, benzyl, phenethyl, α-naphthylmethyl or β-naphthylmethyl. The novel hydrazones and oximes of this invention can be used as growth promoting agents and as coccidiostatic agents for veterinary animals.

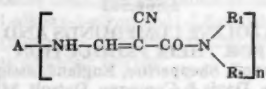
3,560,491

ANTHRAQUINONE DYESTUFFS

Rütger Neeff, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany, a corporation of Germany

No Drawing. Filed July 10, 1967, Ser. No. 651,980
Claims priority, application Germany, July 16, 1966, F 49,712
Int. Cl. C07c 97/12
U.S. Cl. 260—240 **13 Claims**

This invention concerns anthraquinone dyestuffs of the formula



wherein A is an anthraquinone radical, *n* is an integer from 1 to 4 and R_1 and R_2 complete the residue of aliphatic or heterocyclic amines. These dyestuffs are prepared by reaction of the appropriate cyanoacetic acid amide with N-anthraquinonyl-N'-formamidium salts. These dyestuffs are useful for dyeing or printing of textiles.

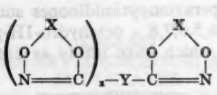
3,560,492

ETHYLENICALLY-UNSATURATED CYCLIC NITRILE ADDUCT COMPOUNDS

Emmett H. Burk, Jr., Glenwood, Ill., and Donald D. Carlos, Crown Point, Ind., assignors to Sinclair Research, Inc., New York, N.Y.

No Drawing. Application Nov. 9, 1967, Ser. No. 681,925, now Patent No. 3,480,595, dated Nov. 25, 1969, which is a continuation-in-part of application Ser. No. 592,285, Nov. 7, 1966. Divided and this application Dec. 6, 1968, Ser. No. 804,030
Int. Cl. C07d 85/52, 87/02, 91/04
U.S. Cl. 260—240 **17 Claims**

The disclosure is of ethylenically-unsaturated cyclic nitrile compounds of the formula



wherein X is a thionyl, carbonyl or oxalyl group, Y is an addition-polymerizable, ethylenically-unsaturated group (e.g., vinyl), and *x* is 0 or 1. The compounds may be polymerized to form homopolymers or addition polymers with ethylenically-unsaturated polymerizable monomers (e.g. styrene).

3,560,493

SPIRO DIBENZO[a,d]CYCLOHEPTEN-OXAZOLIDINE AND OXAZINE

Martin A. Davis, Montreal, Quebec, Canada, assignor to Ayerst, McKenna & Harrison Limited, Laurent, Quebec, Canada

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,779
Int. Cl. C07d 85/26, 87/06
U.S. Cl. 260—244 **3 Claims**

There are disclosed herein spiro[5H-dibenzo[a,d]cycloheptene-5,2'-oxazolidine] and 3', 4', 5', 6'-tetrahydrospiro [5H - dibenzo[a,d]cycloheptene - 5,2' (2'H) - 1',3' - oxazine]. The compounds have antibacterial, trichomonacidal, and anticonvulsant activities and methods for their preparation and use are also disclosed.

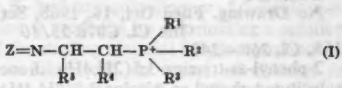
3,560,494

PROCESS FOR PHOSPHONIC ETHYLATION OF AMINES

Frederick Charles Copp, London, England, assignor to Burroughs Wellcome & Co (U.S.A.) Inc., Tuckahoe, N.Y.

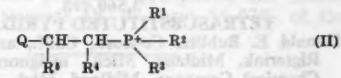
No Drawing. Filed Oct. 18, 1966, Ser. No. 587,394
Int. Cl. C07d 87/26
U.S. Cl. 260—247 **9 Claims**

A method for preparing the cation of Formula I



(I)

which comprises reacting a cation of Formula II



(II)

with a secondary amine Z=NH; where R^1, R^2 and R^3 are lower alkyl or phenyl, R^4 is hydrogen, R^5 is hydrogen or lower alkyl, Q is phenoxy unsubstituted or substituted with lower alkyl, lower alkoxy or halogeno, Z=N— is unsubstituted di-lower alkylamino, pyrrolidino, morpholino or piperidino, in all definitions above lower alkyl and lower alkoxy have 1 to 5 carbons. The products of this method are useful as intermediates in the preparation of well known antihistimines and analgesics.

3,560,495

1-HETEROCYCLIC AMINO METHYL OR 1-HETEROCYCLIC HYDRAZINO METHYL-3-PHTHALIMIDO OR (3',6' - DITHIA - 3',4',5',6' - TETRAHYDROPHTHALIMIDO) - PYRROLIDINEDIONES - 2,5 OR PIPERIDINEDIONES-2,6

Ernst Frankus, Dorfstrasse 14, Schleckheim, near Aachen, Germany; Heinrich Mueckter, Eupener Str. 291, Aachen, Germany; and Siegfried Herrling, Auf der Liester 8; Franz Otto, Galmeistrasse 57; and Horst Boehlke, Trockener Weiher 33, all of Stolberg, Rhineland, Germany

No Drawing. Filed May 9, 1966, Ser. No. 548,400
Claims priority, application Austria, Oct. 15, 1965, A 9,341/65; Germany, May 8, 1965, P 15 45 672.1; Oct. 13, 1965, P 15 45 707.5
Int. Cl. C07d 87/46
U.S. Cl. 260—247.1 **7 Claims**

Dicarboxylic acid imides which are substituted by an acylated amino or imino group and at the imido group by basically substituted methyl have valuable pharmacological properties, such as antitumor, immuno-suppressive, blood pressure lowering, and sedative properties. Examples of such compounds are 3-phthalimido piperidinediones-2,6 substituted in 1-position by a morpholino, piperidino, or pyrrolidino methyl group or by an N-methyl-N-morpholino or N-methyl-N-piperidino amino methyl group; 3 - (3',5'-dithia-3',4',5',6'-tetrahydrophthalimido) piperidinedione-2,6 substituted in 1-position by a morpholino, piperidino, or pyrrolidino methyl group; 3-phthalimido pyrrolidinedione-2,5 substituted in 1-position by a morpholino, piperidino, or pyrrolidino methyl group, and others.

3,560,496
2-BENZYL-as-TRIAZINE-3,5(2H,4H) DIONES
Harold L. Howes, Jr., and Richard C. Koch, New London, Conn., assignors to Chas. Pfizer & Co., Inc., New York, N.Y., a corporation of Delaware
No Drawing. Filed Oct. 16, 1968, Ser. No. 768,192
Int. Cl. C07d *55/10*
U.S. Cl. 260—248 9 Claims
2-benzyl-as-triazine-3,5(2H,4H) diones and novel 2-substituted-benzyl-as-triazine-3,5(2H,4H) diones and their use as agents for the control of coccidiosis are described.

3,560,497
2-PHENYL-as-TRIAZINE-3,5(2H,4H) DIONES
Max W. Miller, Stonington, Conn., assignor to Chas. Pfizer & Co., Inc., New York, N.Y., a corporation of Delaware
No Drawing. Filed Oct. 16, 1968, Ser. No. 768,191
Int. Cl. C07d *55/10*
U.S. Cl. 260—248 6 Claims
2-phenyl-as-triazine-3,5(2H,4H) diones and novel 2-substituted-phenyl-as-triazine-3,5(2H,4H) diones and their use as agents for the control of coccidiosis are described.

3,560,498
TETRASUBSTITUTED PYRIDAZINES
Donald E. Bublitz, Concord, Calif., and Raymond H. Rigterink, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Aug. 14, 1968, Ser. No. 752,720
Int. Cl. C07d *51/76*
U.S. Cl. 260—250 10 Claims
Tetra(methylthio)pyridazine and tetra(phenylthio)pyridazine and the tetrasubstituted pyridazines in which from one to three of the substituents are methylthio, ethylthio, methoxy, or ethoxy and the remaining substituents are chloro. These compounds are useful as pesticides.

3,560,499
PROCESS FOR THE PREPARATION OF 1,2,8,9-TETRAAZAPHENALENES
Karl J. Doebel, Ossining, and John E. Francis, Pleasantville, N.Y., assignors to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Continuation-in-part of applications Ser. No. 445,762, Apr. 5, 1965, Ser. No. 539,303, Apr. 1, 1966, and Ser. No. 583,980, Oct. 3, 1966. This application Nov. 13, 1968, Ser. No. 775,550
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 7 Claims
3-keto-2,3 - dihydro - 1,2,8,9-tetraazaphenalene and the corresponding 7-phenyl compound are prepared by treating 3-substituted phthalic acid derivatives with hydrazine. The compounds possess hypotensive properties and are chemical intermediates.

3,560,500
3-HALO-1,2,8,9-TETRAAZAPHENALENES
Karl J. Doebel, Ossining, and John E. Francis, Pleasantville, N.Y., assignors to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 718,227, Apr. 2, 1968, which is a continuation-in-part of applications Ser. No. 445,762, Apr. 5, 1965, Ser. No. 539,303, Apr. 1, 1966, and Ser. No. 583,980, Oct. 3, 1966. This application Mar. 24, 1969, Ser. No. 810,008
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 7 Claims
3-halo-1,2,8,9-tetraazaphenalenes optionally substituted in the 4, 5, 6, 7 and/or 9 positions and their salts are intermediates for the preparation of the corresponding 3-amino-1,2,8,9-tetraazaphenalenes which are cardiovascular agents. Representative embodiments are 3-chloro-1,2,8,9-tetraazaphenalene and 3-bromo-9-methyl-1,2,8,9-tetraazaphenalene.

3,560,501
PROCESS FOR MAKING DIHYDROQUINAZOLINES
Gordon Northrop Walker, Morristown, N.J., assignor to Ciba Corporation, New York, N.Y.
No Drawing. Filed Sept. 15, 1966, Ser. No. 579,483
Int. Cl. C07d *51/48*
U.S. Cl. 260—251 1 Claim
2-hydroxy- or mercapto-4-aryl-quinazolines, or the esters or ethers thereof, can be partially reduced with alkali or alkaline earth metal borohydrides, to form the corresponding 3,4-dihydro derivatives, which are valuable intermediates in the preparation of pharmacologically active 2-amino derivatives thereof.

3,560,502
NEW QUINAZOLINE COMPOUNDS AND METHODS FOR THEIR PRODUCTION
John Davoll, Shepperton, England, assignor to Parke, Davis & Company, Detroit, Mich.
No Drawing. Filed May 24, 1968, Ser. No. 731,727
Claims priority, application Great Britain, May 25, 1967, 24,462/67
Int. Cl. C07d *51/48*
U.S. Cl. 280—256.4 6 Claims
2,4-diamino - 6 - (substituted nitrosamino)quinazoline compounds and salts thereof. The substituent on the 6-nitrosamino group is a group such as benzyl, substituted benzyl, naphthylmethyl, furylmethyl, thienylmethyl, or pyridylmethyl. The compounds can also be substituted at the 5-position by chlorine or methyl and at the side-chain carbon atom adjacent to the nitrosamino group by lower alkyl. The compounds have pharmacological activities, primarily an antiparasitic and antimalarial agents.

3,560,503
DI-LOWER ALKYL-SUBSTITUTED OCTAHYDRO-PYRAZINOPYRIMIDINONES
Nitya Anand, Ranjit Kumar Chatterjee, Raman Narayana Iyer, Ranjana Sakena, and Amiya Bhushan Sen, Lucknow, India, assignors to Council of Scientific and Industrial Research, New Delhi, India
No Drawing. Filed Sept. 18, 1968, Ser. No. 760,704
Int. Cl. C07d *57/24*
U.S. Cl. 260—256.4 2 Claims
Substituted piperazinopyrimidinones such as 2-ethyl-6-methyl - 2,3,4,4a,5,6,7,8 - octahydro-1H-pyrazino[1,2-c] pyrimidin-1-one which have utility as antifilarial agents.

3,560,504
VIROSTATICALLY EFFECTIVE SUBSTITUTED 3-ALKENYL-5-ETHYL URACIL COMPOUNDS
Kailash Kumar Gauri, Lentfohrden, Holstein, Germany, assignor to Robugen G.m.b.H., Esslingen am Neckar, Germany, a company of Germany
No Drawing. Filed Sept. 3, 1968, Ser. No. 757,146
Int. Cl. C07d *51/30*
U.S. Cl. 260—260 12 Claims
Highly effective virostatic agents are substituted 5-ethyl uracil compounds which have alkenyl with 3 to 6 carbon atoms in 3-position and may be substituted in 1-position by alkyl with 1 to 4 carbon atoms, cycloalkyl, aryl, or aralkyl and in 4-position by halogen. Examples of such compounds are 1,5-diethyl-3-allyl-4-chloro uracil, 1-methyl-3-allyl or crotyl-4-chloro-5-ethyl uracils, 1-methyl or ethyl-3-allyl or crotyl-5-ethyl uracils. They are preferably obtained by alkenylation in 3-position of the corresponding 5-ethyl uracil compounds which have in 3-position hydrogen. They are preferably topically applied

to the virus-affected areas of the body in the form of solutions, ointments, powders, sprays, or the like which contain between about 0.5% and about 50% thereof.

3,560,505

SUBSTITUTED 7-(1-ALKOXY - 1 - ALKEN-1-YL)-7,8-DIHYDRO-6-METHOXY-6,14-ENDO- (ETHENO OR ETHANO) CODIDES AND MORPHIDES

John Johnston Brown, Pearl River, N.Y., Robert Allis Hardy, Jr., Ridgewood, N.J., and Carol Nora Roth, née Carol Therese Nora, Houston, Tex., assignors to American Cyanamid Company, Stamford, Conn., a corporation of Maine

No Drawing. Continuation-in-part of application Ser. No. 671,106, Sept. 27, 1967, which is a continuation-in-part of application Ser. No. 642,698, June 1, 1967. This application May 15, 1969, Ser. No. 825,052

Int. Cl. C07d *43/28;* A61k *27/00*

U.S. Cl. 260—285 10 Claims

This disclosure describes compounds of the class of substituted 7-(1-alkoxy-1-alken-1-yl)-7,8-dihydro-6-methoxy-6,14-endo- (etheno or ethano) codides and morphides which possess analgesic activity.

3,560,506

SUBSTITUTED 7-[DI(LOWER ALKOXY)METHYL]- AND 7-(LOWER ALKYLENEDIOXYMETHYL)-7,8-DIHYDRO-6-METHOXY-6,14-ENDO- (ETHENO OR ETHANO) CODIDES AND MORPHIDES

John Johnson Brown, Pearl River, N.Y., Robert Allis Hardy, Jr., Ridgewood, N.J., and Carol Nora Roth, Née Carol Therese Nora, Houston, Tex., assignors to American Cyanamid Company, Stamford, Conn., a corporation of Maine

No Drawing. Continuation-in-part of application Ser. No. 671,128, Sept. 27, 1967, which is a continuation-in-part of application Ser. No. 634,099, Apr. 27, 1967. This application May 15, 1969, Ser. No. 825,053

Int. Cl. C07d *43/28;* A61k *27/00*

U.S. Cl. 260—285 10 Claims

This disclosure describes compounds of the class of substituted 7-[di(lower alkoxy)methyl]- and 7-(lower alkylenedioxymethyl) - 7,8 - dihydro-6-methoxy-6,14-endo-(etheno or ethano) codides and morphides which possess analgesic activity.

3,560,507

QUATERNARY AMMONIUM ALKENYL SUCCINATES

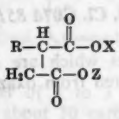
Reginald L. Wakeman, Philadelphia, Pa., and Joseph F. Coates, Washington, D.C., assignors to Millmaster Onyx Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 365,796, May 7, 1964. This application Feb. 27, 1968, Ser. No. 708,520

Int. Cl. C07d *35/24*

U.S. Cl. 260—286 14 Claims

The products of this invention conform, in general, to the following structure:



wherein R is a straight or branched chain alkenyl radical containing from 6 to 18 carbon atoms; X or Z or both are cations of microbiocidal quaternary ammonium compounds; or either X or Z is such a quaternary ammonium cation and the other is hydrogen or an alkali metal cation such as sodium, potassium, etc., or an equivalent such as ammonium or triethanolammonium cation.

3,560,508

PROCESS FOR THE PRODUCTION OF 5,7-DICHLORO-8-HYDROXY-QUINOLINE AND 5,7-DICHLORO-8-HYDROXY-QUINALDINE

Karl Ruhl, Castrop-Rauxel, and Georg Grigoleit and Ludwig Rappen, Duisburg-Meiderich, Germany, assignors to Rutgerswerke und Teerverwertung Aktiengesellschaft, Frankfurt-am-Main, Germany

Frankfurt-am-Main, Germany

No Drawing. Filed Feb. 20, 1968, Ser. No. 706,759

Int. Cl. C07d *33/44*

U.S. Cl. 260—289 6 Claims

5,7 - dichloro - 8 - hydroxy-quinoline or 5,7-dichloro-8-hydroxy-quinaldine is produced by chlorinating a solution in chloroform of the starting material 8-hydroxy-quinoline or 8-hydroxy-quinaldine with an excess of chlorine in the presence in the solution of 0.5 to 5% by weight of iodine, based on the weight of the starting compound. After chlorination, the solvent is removed from the reaction mixture by distillation with the addition of water and the chlorinated product is precipitated and filtered off. The yield amounts e.g. to about 94–97% of the theory.

3,560,509

O-(1-ADAMANTANECARBONYL)-SCOPOLAMINE

Robert B. Moffett, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Feb. 19, 1969, Ser. No. 800,752

Int. Cl. C07d *43/06*

U.S. Cl. 260—292 3 Claims

O-(1-adamantanecarbonyl) - scopolamine (including acid addition salts, quaternary ammonium salts, and the N-oxide) prepared by the reaction of 1-adamantanecarbonyl chloride and scopolamine useful as an anticholinergic, mydriatic, antiperspirant, antispasmodic, antisectory.

3,560,510

2-BENZHYDRYLQUINUCLIDINES

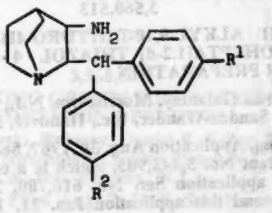
Edward John Warawa, Milwaukee, Wis., assignor to Aldrich Chemical Company, Inc., Milwaukee, Wis.

No Drawing. Filed Mar. 5, 1969, Ser. No. 804,691

Int. Cl. C07d *39/06*

U.S. Cl. 260—293 19 Claims

Compounds of the formula



where R^1 and R^2 are both hydrogen, chloro, bromo, fluoro, trifluoromethyl, methoxy, methylenedioxy or amino; and the pharmaceutically acceptable nontoxic salts thereof exhibit diuretic activity and are useful as diuretic agents in mammals to promote the excretion of water and sodium.

3,560,511

TOPICAL ANAESTHETIC PIPERIDYL CARBINOL

Luigi Bernardi, Via Pinerolo 30, and Cesare Bertazzoli, V. le Caterina de Forli 16, both of Milan, Italy, and Dario Ghiringhelli, Via Caprano, Angera (Varese), Italy

No Drawing. Continuation-in-part of application Ser. No. 612,801, Jan. 31, 1967. This application Dec. 24, 1968, Ser. No. 786,738

Claims priority, application Italy, Dec. 29, 1967, 24,494A/67

Int. Cl. C07d *29/24*

U.S. Cl. 260—294.3 2 Claims

Disclosed is diphenylacetate of 1,α,α-trimethyl-2-piperidylcarbinol and the process for the preparation thereof from α,α-dimethyl-2-piperidylcarbinol, which is first hydrogenated to the corresponding piperidylcarbinol, treating this compound with formaldehyde and hydrogen in the presence of a suitable catalyst, and esterifying the product to form the diphenylacetate. The product is useful as a topical anaesthetic. 1,α,α-trimethyl-2-piperidylcarbinol prepared as above is a racemic base which may be further separated into the two optical antipodes, the D(+) form of which has been found to have a higher local anaesthetic activity and a lower toxicity than the corresponding base. Either the racemic base or its two optical antipodes can be reacted with the conventional acids for forming pharmaceutically acceptable acid addition salts.

3,560,512

3-SUBSTITUTED-2,1-BENZISOTHIAZOLINE-2,2-DIOXIDES

Joseph A. Skorcz, Milwaukee, and John T. Suh and Claude I. Judd, Mequon, Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 571,972, Aug. 12, 1966. This application Nov. 14, 1967, Ser. No. 682,991

Int. Cl. C07d *91/06*

U.S. Cl. 260—301 7 Claims

The compounds are 2,1-benzisothiazoline-2,2-dioxides substituted in the 3 position which are useful in the preparation of wood preservatives, moth proofing agents, pickling inhibitors and as pharmaceutical agents, particularly antihypertensive agents. Among the compounds disclosed are 1,3-dimethyl-3-(2′-carboxyethyl)-2,1-benzisothiazoline-2,2-dioxide and 1,3-dimethyl-3-[(N-dimethylaminoethyl) - 2′ - carbamylethyl]-2,1-benzisothiazoline-2,2-dioxide.

3,560,513

2-LOWER ALKYL-9,10-DIHYDRO-4H-BENZO[5,6] CYCLOHEPTA[1,2-d] THIAZOL - 4 - ONES AND THEIR PREPARATION

Eugene E. Galantay, Morristown, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Application Aug. 30, 1967, Ser. No. 664,313, now Patent No. 3,442,903, which is a continuation-in-part of application Ser. No. 610,780, Jan. 23, 1967. Divided and this application Jan. 21, 1969, Ser. No. 792,766

Int. Cl. C07d *91/42*

U.S. Cl. 260—302 5 Claims

The compounds are of the class of 4-(3-mono- and dialkylaminopropylidene)-2-lower alkyl - 9,10-dihydro-4H-benzo[5,6]cyclohepta[1,2-d]thiazoles which are useful as tranquilizers. The compounds are prepared by thiating a 2-lower alkyl-9,10-dihydro-4H-benzo[5,6]cyclohepta[1,2-d]oxazol-4-one, treating the resulting benzocycloheptathiazol-4-one with a metallo dialkylaminopropyl halide Grignard reagent and dehydrating the carbinol resulting from the hydrolysis of the Grignard adduct to obtain the corresponding 4-(3-dialkylaminopropylidene)-2-lower alkyl-9,10 - dihydro - 4H-benzo[5,6]cyclohepta[1,2-d]thiazole, which may then be N-dealkylated to the corresponding 3-monoalkylaminopropylidene-containing analog.

3,560,514

2-(LITHIUMMETHYL)-4,5-DIANISYLTHIAZOLE

Daniel Lednicer, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Original applicaton Sept. 26, 1966, Ser. No. 581,747, now Patent No. 3,458,526. Divided and this application Oct. 17, 1968, Ser. No. 768,519

Int. Cl. C07d *91/34*

U.S. Cl. 260—302 1 Claim

The present invention is directed to novel compounds and is more particularly concerned with certain 2-substituted-4,5-dianisylthiazoles [2-substituted-4,5-bis(p-methoxyphenyl)thiazoles], certain novel intermediates therefor and the production thereof.

3,560,515

NEW THIAZOLOBENZODIAZEPINE COMPOUNDS AND METHODS FOR THEIR PRODUCTION

Edward F. Elslager and Donald F. Worth, Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich., a corporation of Michigan

No Drawing. Filed Aug. 5, 1968, Ser. No. 750,012

Int. Cl. C07d *99/06*

U.S. Cl. 260—306.7 7 Claims

5,10-dihydro - 3 - (aryl)thiazolo[3,2-b][2,4]benzodiazepines, in which the 3-aryl group is phenyl, hydroxyphenyl, dihydroxyphenyl, (lower alkoxy)phenyl, di(lower alkoxy) phenyl, tolyl, xylyl, 2-thienyl, or 2-furyl; acid-addition salts thereof; and their production by reacting 1,2,4,5-tetrahydro-3H-benzo[2,4]diazepine-3-thione with an appropriately substituted halomethyl aryl ketone. The compounds of the invention are useful as inhibitors of blood platelet aggregation.

3,560,516

OXAZOLE DERIVATIVES

Ryonosuke Yoshida, Kamakura-shi, Kanagawa-ken, Itsutoshi Maeda, Tokyo, Kazushi Togo, Kawasaki-shi, Kanagawa-ken, Soichiro Asai, Tokyo, and Masahiro Takehara, Kawasaki-shi, Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

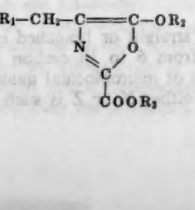
No Drawing. Filed Aug. 1, 1967, Ser. No. 657,517

Claims priority, application Japan, Aug. 8, 1966, 41/52,012, 41/52,013, 41/52,014; Oct. 3, 1966, 41/65,041; Jan. 10, 1967, 42/1,893; May 15, 1967, 42/30,724

Int. Cl. C07d *85/00*

U.S. Cl. 260—307 4 Claims

Pyridine derivatives which are known precursors of vitamin B_6 are prepared from oxazole derivatives of the formula



wherein R_1 is hydrogen, carboxy, or carbo-lower alkoxy, R_2 is lower alkyl, and R_3 is hydrogen or lower alkyl by partial decarboxylation and further reactions in a known manner, or by Diels-Alder reaction with suitable dienophiles. The oxazole derivatives are prepared by reacting a dialkyl oxalate with an ester of alanine or aspartic acid to the corresponding N-alkoxalyl amino acid ester, and closing the oxazole ring by means of a dehydrating agent and an organic base.

3,560,517
ISOXAZOLIDINE CARBOXANILIDES

Hans Grabinger, Richard Sehring, and Karl Zeile, Ingelheim am Rhein, Germany, assignors to C. H. Sohn Boehringer, Ingelheim am Rhein, Germany

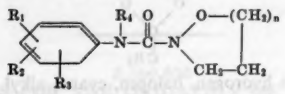
No Drawing. Filed Dec. 6, 1967, Ser. No. 688,319

Claims priority, application Germany, Dec. 6, 1966, B 90,229; May 19, 1967, B 92,616; May 23, 1967, B 92,677

Int. Cl. C07d *85/08, 87/04*

U.S. Cl. 260—307 **6 Claims**

Novel urea derivatives of the formula



(I)

wherein R_1 and R_2 are selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy and lower alkylthio of 1 to 5 carbon atoms, trifluoromethyl and aryloxy which may be substituted with a substituent selected from the group consisting of halogen and alkylthio of 1 to 5 carbon atoms, R_3 is selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy and lower alkylthio of 1 to 5 carbon atoms and aryloxy which may contain substituents selected from the group consisting of halcgen and alkylthio of 1 to 5 carbon atoms, R_4 is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms and n is an integer from 1 to 2 which compounds possess herbicidal activity.

3,560,518
AROMATIC-POLY(NITRILE CARBONATES)

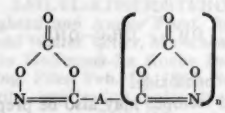
Emmett H. Burk, Jr., Glenwood, Ill., and Donald D. Carlos, Crown Point, Ind., assignors to Sinclair Research, Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 659,618, Aug. 10, 1967, which is a continuation-in-part of application Ser. No. 502,450, Oct. 22, 1965. This application Mar. 18, 1968, Ser. No. 714,003

Int. Cl. C07d *85/06*

U.S. Cl. 260—307 **6 Claims**

There are disclosed compounds of the formula:



wherein n is an integer of 1 to 3 and A is aromatic hydrocarbon of up to about 30 carbon atoms and of 2 to 3 monocyclic aromatic rings or one fused bicyclic aromatic ring or one fused tricyclic aromatic ring. The compounds can be made by reacting the corresponding hydroxamic acids and phosgene. The compounds are useful as, inter alia, aromatic polyisocyanate generators and have the advantage over conventional aromatic polyisocyanates in that they can be easily handled and stored.

3,560,519
AROMATIC MONO(NITRILE CARBONATES)

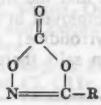
Emmett H. Burk, Jr., Glenwood, Ill., and Donald D. Carlos, Crown Point, Ind., assignors to Sinclair Research Inc., New York, N.Y.

No Drawing. Continuation of application Ser. No. 671,932, Oct. 2, 1967, which is a continuation-in-part of application Ser. No. 502,620, Oct. 22, 1965. This application Mar. 28, 1969, Ser. No. 816,150

Int. Cl. C07d *85/06*

U.S. Cl. 260—307 **3 Claims**

Compounds of the formula



wherein R is an aromatic hydrocarbon radical of 1 to 3 aromatic rings which can be substituted with, for instance, halogen, nitro, or alkoxy, e.g., methoxy, groups except that when R is monocyclic, R is substituted on the ring with at least one of the aforementioned groups. The compounds can be made by reacting the corresponding hydroxamic acids and phosgene.

3,560,520
IMIDAZOLINE/ALKYLENE OXIDE REACTION PRODUCTS

Warren L. Perilstein, Orchard Lake, Mich., assignor to Ethyl Corporation, New York, N.Y., a corporation of Virginia

No Drawing. Original application Dec. 22, 1967, Ser. No. 692,706, now Patent No. 3,449,095, dated June 10, 1969. Divided and this application Dec. 30, 1968, Ser. No. 800,315

Int. Cl. C07d *49/30*

U.S. Cl. 260—309.6 **9 Claims**

A gasoline having improved detergency and antiicing properties is described. The improved properties are effected by adding to the gasoline a small but effective quantity of a novel reaction product of (a) 1-hydroxyethyl-2-alkenyl imidazoline and (b) an alkylene oxide. The novel additive and the method of preparing it are also described.

3,560,521
BLOCKING GROUPS FOR CYSTEINE CONTAINING PEPTIDES

John D. Milkowski, Rahway, Daniel F. Veber, Plainfield, and Ralph F. Hirschmann, Scotch Plains, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Aug. 7, 1967, Ser. No. 658,665

Int. Cl. C07d *27/10*

U.S. Cl. 260—326.3 **2 Claims**

Novel protecting groups for peptides containing a cysteine residue. Process for the synthesis of peptides containing a cysteine residue wherein the mercapto function of the cysteine residue is protected by a labile blocking group. Novel intermediates useful in peptide synthesis.

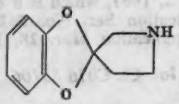
3,560,522

SPIRO[1,3-BENZODIOXOL-2,3'-PYRROLIDINE] AND INTERMEDIATES THEREFOR

John Gmunder, Muttenz, Switzerland, and Richard Berthold, Reinach, Basel-Land, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

No Drawing. Filed Jan. 15, 1969, Ser. No. 791,509
Claims priority, application Switzerland, Jan. 24, 1968, 1,118/68; Apr. 8, 1968, 5,192/68; May 29, 1968, 7,961/68
Int. Cl. C07d *13/10, 27/04, 27/10*
U.S. Cl. 260—326.5 3 Claims

The invention concerns spiro[1,3-benzodioxol-2,3'-pyrrolidine] of the formula:



and pharmaceutically acceptable acid addition salts thereof. Processes for preparing the above compound and salts are also described and the invention also concerns various intermediates employed in such processes. Spiro-[1,3-benzodioxol-2,3'-pyrrolidine] and pharmaceutically acceptable acid addition salts thereof are useful antidepressants.

3,560,523

2-SUBSTITUTED Δ_1-PYRROLINE DERIVATIVES AND METHOD OF PREPARATION

André Etienne, Paris, and Yves Correia, Saint-Auban, France, assignors to Pechiney-Saint-Gobain, Paris, France

No Drawing. Filed Nov. 1, 1967, Ser. No. 679,651
Claims priority, application France, Nov. 3, 1966, 82,355
Int. Cl. C07d *27/14*
U.S. Cl. 260—326.9 7 Claims

The invention is concerned with the preparation of 2-substituted Δ_1-pyrroline derivatives having the formula

in which Y is a substituted alkyl group in which the substituent is nitro, cyano, carbonyl and/or alkyl-carboxyl by reaction of 2-alkoxy Δ_1-pyrroline with a labile hydrogen compound containing the Y group.

3,560,524

PREPARATION OF EPISULFIDES FROM EPOXIDES

Donald L. Clason, Mentor, and Lester E. Coleman, Willoughby Hills, Ohio; said Clason assignor to The Lubrizol Corporation, Wickliffe, Ohio

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,260
Int. Cl. C07d *41/06, 59/00*
U.S. Cl. 260—327 5 Claims

Epoxides are converted into episulfides in excellent yield by reaction with a thiolactam having 5–7 atoms in the ring. 2-thiopyrrolidone and ε-thiocaprolactam, especially the former, are preferred.

3,560,525

5-PHENYL-2-FURANACETIC ACIDS, 5-PHENYL-2-THIOPHENEACETIC ACIDS, AND THEIR DERIVATIVES

James S. Kaltenbronn, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

No Drawing. Continuation-in-part of application Ser. No. 598,912, Dec. 5, 1966. This application Oct. 13, 1967, Ser. No. 675,036
Int. Cl. C07d *63/12, 5/16;* A61b *27/00*
U.S. Cl. 260—332.2 5 Claims

5-phenyl-2-furanacetic acids, 5-phenyl-2-thiopheneacetic acids, and salts, lower alkyl ester and lower dialkylaminoalkyl esters thereof, in which the phenyl group is optionally substituted by m-halo, p-halo, m-methyl, p-methyl, m-methoxyl, and p-methoxyl, useful as pharmacological agents exhibiting anti-inflammatory activity; and their production by (a) hydrolyzing an appropriately substituted compound having a group hydrolyzable to a carboxyl group, such as, for example, 5-phenyl-2-furanacetonitrile or 5-phenyl-2-thiopheneacetonitrile, (b) reacting the hydrazone of an appropriately substituted heterocyclic glyoxylic acid compound with a base, and (c) esterifying the free acid compounds of the invention to give the esters of the invention.

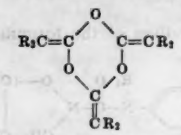
3,560,526

SUBSTITUTED TRIOXANES

Max M. Boudakian, Hamden, and Milton Lapkin, Woodbridge, Conn., assignors to Olin Mathieson Chemical Corporation

No Drawing. Filed Aug. 2, 1968, Ser. No. 749,617
Int. Cl. C07d *19/00*
U.S. Cl. 260—340.7 6 Claims

Substituted trioxanes having the formula



wherein R is hydrogen, halogen, cyano, alkyl or aryl are prepared by dehydrohalogenation of selected α-haloaldehydes. These substituted trioxanes are useful as end-capping reagents for polyacetal resins and as acetylating agents for alcohols, amines, acids, etc.; they are also valuable sources of monomeric ketenes.

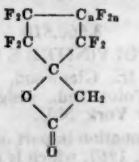
3,560,527

β-LACTONES OF (1-HYDROXYPERFLUOROCYCLOALKYL)ACETIC ACIDS AND PREPARATION THEREOF

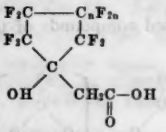
Richard F. Sweeney, Dover, and Alson K. Price, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Aug. 9, 1967, Ser. No. 659,338
Int. Cl. C07d *3/00*
U.S. Cl. 260—343.9 11 Claims

Fluorinated lactones having the formula:



wherein *n* may be 0–2 are prepared by dehydrating a corresponding (1-hydroxyperfluorocycloalkyl)acetic acid having the formula



with phosphorus pentoxide.

The fluorinated lactones may also be prepared by heating a corresponding acid chloride of the above-described acids to decomposition, or by heating a mixture of such an acid with thionyl chloride, in the presence of an organic tertiary amine catalyst, for a period of time, and at a sufficiently high temperature, to form the corresponding subject fluorinated lactone. The fluorinated lactones may be converted to surface active unsaturated acids by reaction with anhydrous sulfuric acid.

3,560,528

6a,10a-TRANS-6a,7,10,10a-TETRAHYDRODIBENZO (b,d)-PYRAN PRODUCTION

Theodor Petrzilka, 6 Rigistrasse, Erlenbach, Switzerland

No Drawing. Filed May 8, 1968, Ser. No. 727,711

Claims priority, application Switzerland, May 19, 1967, 7,081/67

Int. Cl. C07d *7/20*

U.S. Cl. 260—345.3 8 Claims

This invention is directed to a process of producing 1-hydroxy - 3 - n-amyl-6,6,9-trimethyl-6a,10a-trans-6a,7,10, 10a - tetrahydrodibenzo(b,d) - pyran and related pyrans from resorcinols, which pyrans possess psychotomimetic and analgesic activity.

3,560,529

POLYMERIZATION OF ITACONIC ANHYDRIDE

John H. Blumbergs, Highland Park, and Donald G. MacKellar, Trenton, N.J., assignors to FMC Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Filed Sept. 10, 1968, Ser. No. 758,669

Int. Cl. C08f *7/12*

U.S. Cl. 260—346.8 4 Claims

Itaconic anhydride is homopolymerized by heating said anhydride at a temperature of at least about 70° C. in the presence of an initiating amount of a mixed itaconic-acyl peroxide.

3,560,530

PROCESS FOR THE OXIDATION OF ALKENES TO ALKENE OXIDES

Alvin B. Stiles, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 596,817, Nov. 25, 1966, which is a continuation-in-part of application Ser. No. 293,156, July 5, 1963, which in turn is a continuation-in-part of application Ser. No. 2,802, Jan. 18, 1960. This application June 19, 1969, Ser. No. 834,904

Int. Cl. C07d *1/14*

U.S. Cl. 260—348.5 4 Claims

Alkene oxides are prepared in good yield from alkenes having 2–4 carbon atoms using a non-porous silver-cadmium alloy catalyst containing 1 to 15%, by weight of cadmium.

3,560,531

METALLATION WITH ALKALI METALS

Henri Marie Normant, Paris, France, assignor to Rhone-Poulenc S.A., Paris, France, a French body corporate

No Drawing. Filed Mar. 9, 1966, Ser. No. 532,840

Claims priority, application France, Mar. 12, 1965, 9,021

Int. Cl. C07c *15/16*

U.S. Cl. 260—389 2 Claims

Compounds containing active hydrogen are metallated by contact with an alkali metal in a medium comprising hexamethylphosphoramide.

3,560,532

3-SILYL-ETHER STEROIDS

Marco Cereghetti and Andor Furst, Basel, Max Vecchi, Reinach, and Walter Vetter, Munchenstein, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Feb. 13, 1969, Ser. No. 799,113

Claims priority, application Switzerland, Feb. 23, 1968, 2,751/68

Int. Cl. C07c *169/34, 169/20*

U.S. Cl. 260—397.4 18 Claims

3-silyl-ether steroids of the androstane, pregnane, and corticoid series are prepared by reacting the corresponding 3-oxo-steroids with a silylating agent. End-products of the invention are useful as either anabolic, androgenic, progestational or corticoid agents depending upon the particular derivative prepared.

3,560,533

17α - (2 - ALKYNYL) - 1 - METHYLESTRA - 1,3,5(10)-TRIENE-3,17β-DIOLS AND ESTERS THEREOF

Paul D. Klimstra, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed Jan. 31, 1969, Ser. No. 795,715

Int. Cl. C07c *169/20*

U.S. Cl. 260—397.5 6 Claims

17α-(2-alkynyl)-1-methylestra - 1,3,5(10) - triene-3, 17β-diols and esters thereof exhibit valuable pharmacological activity, e.g. estrogen-inhibitory, and are prepared by the reaction of 1-methylestra-1,3,5(10)-trien-17-one derivative carrying at the 3-position a substituted oxy group, e.g. tetrahydropyran-2-yloxy, with the Grignard reagent prepared from a 1-halo-2-alkyne followed by cleavage of the 3-(substituted oxy) function and acylation of the resulting diols.

3,560,534

TRANSVINYLATION USING MERCURIC ACETATE/PERCHLORIC ACID CATALYST

John M. MacDonald, Sarnia, Ontario, Canada, assignor to Esso Research and Engineering Company, a corporation of Delaware

No Drawing. Filed Aug. 1, 1967, Ser. No. 657,525

Int. Cl. C11c *3/10*

U.S. Cl. 260—410.9 6 Claims

Vinyl acetate is reacted with C_3 to C_{30} acid in a transvinylation reaction using a combination of mercuric salt and perchloric acid as catalyst.

3,560,535

PROCESS FOR PRODUCTION OF ALKYL ESTERS FROM ALKYL CARBOXYLIC ACID ANHYDRIDES

Gustave Bryant Bachman, Lafayette, Ind., and Gerald M. Tullman, Creve Coeur, Mo., assignors to Purdue Research Foundation, Lafayette, Ind., a corporation of Indiana

No Drawing. Filed Dec. 19, 1968, Ser. No. 785,351

Int. Cl. C07c *67/00*

U.S. Cl. 260—410.9 3 Claims

A process for preparing alkyl esters by reacting iodine with an alkyl carboxylic acid anhydride in the presence of ozone to form the iodine triacylate, adding mercuric oxide and heating at a temperature of about 115–50° C. thereby producing said ester.

3,560,536

FRACTIONATION OF ALKALINE EXTRACTS OF TREE BARKS

Edwin H. Gygi, Longview, and Donald F. Root, Bellevue, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash., a corporation of Washington

Filed Apr. 10, 1967, Ser. No. 629,665

Int. Cl. C11b *13/00*

U.S. Cl. 260—412 6 Claims

A method of separating the aromatic and aliphatic acid salts contained in a water-immiscible alcohol phase of an aqueous alkaline extract of tree bark by washing the alcohol phase with water on a very dilute aqueous caustic solution and separating the aqueous and alcohol phases.

3,560,537

PROCESS FOR PRODUCING STRAIGHT CHAIN MONOBASIC CARBOXYLIC ACID SOAPS AND THEIR DERIVATIVES

William R. Eller, Greenwell Springs, La., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 567,361, July 25, 1966, which is a continuation-in-part of application Ser. No. 530,403, Feb. 28, 1966. This application Nov. 8, 1968, Ser. No. 774,484

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 22 Claims

Normal alcohols having from about 6 to about 30 carbon atoms per molecule are selectively reacted with al-

kali metal hydroxide when in the presence of less reactive branched primary alcohols to produce carboxylic acid soaps of predominantly straight chain carbon skeletal configuration and also to produce hydrogen. The selectivity of reaction of straight chain alcohols and freedom from methylene group attack is enhanced by using proper elevated temperatures in combination with a deficiency of alkali metal hydroxide based on stoichiometric proportions for the total alcohol content of the reaction system and in the absence of oxidants for methylene groups at the temperatures involved. The soaps are usable as such or as synthesis intermediates for derivatives such as corresponding acids.

3,560,538

PROCESS FOR REMOVING FINES FROM MISCELLA

John C. Pressick, Clarendon Hills, Ill., assignor to CPC International Inc., a corporation of Delaware

Filed June 27, 1968, Ser. No. 740,694
Int. Cl. C11b *3/00*
U.S. Cl. 260—428.5 **12 Claims**

Troublesome suspended fines in miscella are removed by a filtration technique which comprises adding water to crude miscella before desolventization but after meal separation. By adding water to the miscella at this point in the process, filtration rates significantly greater than those heretofore used in filtering fines from miscella can be achieved.

3,560,539

SELECTIVE CATALYST RECOVERY

Frank B. Booth, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Aug. 21, 1968, Ser. No. 754,482
Int. Cl. C07f *15/00*; C07c *45/02*; B01i *11/03*
U.S. Cl. 260—429 **7 Claims**

A method for the recovery of complexes of Group VIII noble metals and biphyllic ligands from hydrocarbons or high boiling residues formed in hydrocarbonylation of olefins. The Group VIII noble metal is recovered in accordance by reduction of the high boiling fraction of a hydroformylation reaction medium to convert the aldehyde groups thereto to alcohols. This reduction is effected by treatment with conventional means, e.g., hydrogenation in the presence of heterogeneous hydrogenation catalysts at a temperature from about 25° to 325° C. or by nucleophilic attack by hydride ion by treatment at mild conditions with an alkali metal aluminum hydride or borohydride. The metal complex is essentially insoluble in the resulting alcohol tar and the catalyst precipitate is recovered by conventional solid-liquid separation techniques, e.g., filtration or centrifugation.

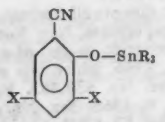
3,560,540

TRIHYDROCARBYL TIN (CYANO) (HALO) PHENOLATES

Adolph J. Deinet, 22 Oakwood Drive, Woodcliff Lake, NJ. 07675

No Drawing. Filed Feb. 19, 1969, Ser. No. 800,741
Int. Cl. C07f *7/22*; A01n *9/00*; B21b *19/04*
U.S. Cl. 260—429.7 **2 Claims**

Organotin compounds that have the structural formula



wherein each R represents an alkyl group having from 4 to 8 carbon atoms or a phenyl group; one of the X substituents represents halogen; and the other X substituent represents hydrogen or halogen are effective in the control of the growth of undesirable organisms.

3,560,541

METHOD OF PREPARING VINYL SILANES

Werner Graf, Ignaz Bauer, Siegfried Nitzsche, and Rudolf Riedle, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Bavaria, Germany

No Drawing. Filed Jan. 14, 1969, Ser. No. 791,166
Claims priority, application Germany, Jan. 16, 1968, P 16 68 855.4
U.S. Cl. 260—448.2 **7 Claims**

The reaction of vinyl halides with hydrogen silicon compounds is carried out in the presence of halogenated organic compounds which are gases at the reaction temperature (i.e. above 500°), whereby the formation of soot is reduced and the yield of product is increased. A typical reaction feed comprises methylhydrogendichlorosilane, vinylchloride and trichloroethylene or ethylbromide.

3,560,542

FUNCTIONAL PERFLUOROALKYLENE ORGANOSILICON COMPOUNDS

Yung Ki Kim and Ogden R. Pierce, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich., a corporation of Michigan

No Drawing. Original application Dec. 2, 1966, Ser. No. 598,613, now Patent No. 3,478,076. Divided and this application Aug. 1, 1969, Ser. No. 846,924
Int. Cl. C07f *7/08*; C08f *11/04*; C10m *1/50*
U.S. Cl. 260—448.2 **4 Claims**

Siloxanes containing at least one unit of the formula

$$XR_f(CH_2CH_2)_nCH_2CH_2SiO_{\frac{3-m}{2}}$$

(with R''_m on the silicon)

for example,

$$C_2H_5OOC(CF_2)_3CH_2CH_2SiO$$

(with CH_3 on the silicon)

are disclosed as lubricants, laminating resins, elastomers and surface active agents.

3,560,543

POLYIMINO ORGANOSILICON COMPOUNDS

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich., a corporation of Michigan

No Drawing. Filed Feb. 19, 1968, Ser. No. 706,680
Int. Cl. C07f *7/10, 7/18*
U.S. Cl. 260—448.2 **9 Claims**

Organosilicon compounds having the substituent group

$$\equiv SiRN(R_1N)_nH$$

where n is at least 14, are made by reacting $\equiv SiRCl$ with

$$N(NR_1)_nNH_2$$

For example,

$$(CH_3O)_2Si(CH_2)_3Cl + H(NCH_2CH_2)_{30}NH_2 \longrightarrow$$

$$(CH_3O)_2Si(CH_2)_3N-(CH_2CH_2N)_{30}H.HCl$$

The organosilicon compounds increase the adhesion of polypropylene and other plastics to glass and glass fibers.

Organosilicon compounds having amino substituents on carbon side chains have obtained considerable commercial success. These include silanes having the aminopropyl group substituted on silicon as well as those having the

aminoethylaminopropyl group. Such silanes have been employed in many applications, including those relating to the priming of surfaces to increase the receptivity of dyes and of organic plastics. U.S. Pats. 3,249,535 and 3,317,577 show organosilicon compounds having polyimine groups attached to the silicon in which the number of imine units range up to about 10.

It has been found that the compositions claimed herein give improved adhesion of certain plastics to glass and are in other ways superior to heretofore known aminosilicon compounds and the heretofore known polyimino silicon compounds.

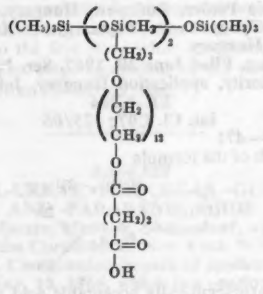
3,560,544

TRIORGANOSILOXY ENDBLOCKED POLYOXYALKYLENE SILOXANE POLYMERS

Loren A. Haluska, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Apr. 1, 1968, Ser. No. 717,929
Int. Cl. C07d *103/02;* **C07f** *7/02*
U.S. Cl. 260—448.2 **9 Claims**

The compositions are of the class of triorganosiloxy endblocked polyoxyalkylene siloxane polymers and salts thereof. It has been found that the compositions described herein are particularly useful as surfactants. Illustrative of the composition in question is a compound of the formula



3,560,545

PROCESS FOR PREPARING METHYL OR PHENYLCHLOROSILANES

Richard Schrader and Hubert Hennek, Freiberg, Karl Dreier and Roland Bugge, Nunchritz, Joh. Frohnert, Freiberg, and Wolfg. Eichler, Nunchritz, Germany, assignors to VEB Chemiewerk Nunchritz, Nunchritz, Germany

Filed May 31, 1968, Ser. No. 733,352
Int. Cl. C07f *7/16*
U.S. Cl. 260—448.2 **7 Claims**

Process for preparing organochlorosilanes, namely methyl- or phenylchlorosilanes wherein silicon-containing starting materials are reacted in the presence of a copper catalyst with methyl- or phenylchloride while being shaken in a vibrating zone during the reaction. In one embodiment, the catalyst is produced during the reaction from parts of the grinding mechanism. The process is carried out preferably in a vibrating mill.

3,560,546

PENTACOORDINATE ENDBLOCKED SILOXANES

Cecil L. Frye, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Feb. 5, 1969, Ser. No. 796,903
Int. Cl. C07d *103/04;* **C07f** *7/04*
U.S. Cl. 260—448.8 **14 Claims**

Pentacoordinate endblocked siloxanes useful as curing agents for epoxy resins and as extreme pressure additives for lubricants are disclosed.

3,560,547

CHLOROCARBONATE PREPARATION

Marion E. Hill, Palo Alto, Calif., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Sept. 19, 1961, Ser. No. 139,582
Int. Cl. C07c *69/00*
U.S. Cl. 260—463 **10 Claims**

1. The process of preparing chlorocarbonates of alkanols substituted in the beta carbon atom by a substituent selected from the group consisting of nitro, and fluoro and nitro groups which comprises: preparing a solution of said alkanol in carbon tetrachloride; heating said solution to the reflux temperature of the carbon tetrachloride in the presence of a ferric chloride catalyst which is at least partially hydrated; and maintaining said temperature whereby the chlorocarbonate of said alkanol is formed.

3,560,548

HALOGENATED BENZHYDRYL CARBONATES

Joseph W. Baker, Kirkwood, and Ignatius Schumacher, Webster Groves, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 7, 1968, Ser. No. 774,170
Int. Cl. C07c *69/00;* **A61k** *27/00*
U.S. Cl. 260—463 **9 Claims**

This disclosure covers halogenated benzhydryl carbonates as new chemical compounds. These compounds have been found to be useful in the control of bacteria.

3,560,549

BETA-CYANOALKYL ETHERS OF POLYOXYALKYLENE ADDUCTS OF MODERATELY HIGH MOLECULAR WEIGHT

Fedor Poppelsdorf, Charleston, W. Va., assignor to Union Carbide Corporation, a corporation of New York

No Drawing. Application June 26, 1963, Ser. No. 290,578, now abandoned, which is a continuation-in-part of abandoned applications Ser. No. 107,060, May 2, 1961, and Ser. No. 230,253, Oct. 12, 1962. Divided and this application Dec. 8, 1967, Ser. No. 688,976
Int. Cl. C07c *121/00, 121/46, 121/66*
U.S. Cl. 260—465 **26 Claims**

Novel cyano compositions are disclosed as well as methods for their preparation. Representative compounds comprise:

(1) α-(2-cyanoethoxy)-ω-(n-butyl)-poly-1,2-oxypropylene
(2) α-ω-bis-(2-cyanoethoxy)-poly-1,2-oxypropylene-1,4, oxybutylene
(3) α-ω-bis-(2-cyanoethoxy)-poly-1,2-oxypropylene
(4) α-ω-bis-(2-cyanoethoxy)-poly-1,2-oxybutylene
(5) 1,2,6-tris[α-(cyanoethoxy)-poly-1,2-oxypropyl] hexane
(6) 1,2,3-tris[α(2-cyanoethoxy)-poly-1,2-oxypropyl] propane
(7) the tris(2-cyanoethyl)-ether of oxypropylated tris-(4-hydroxyphenyl)propane

The instant cyanoethers have biological activity suitable for agricultural use and are intermediates for amines, acids and esters.

3.560,550

PROCESS FOR THE PREPARATION OF CYANO-COMPOUNDS

Azel A. Griswold and Paul S. Starcher, Charleston, W. Va., assignors to Union Carbide Corporation, a corporation of New York

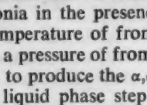
No Drawing. Filed June 26, 1968, Ser. No. 740,086
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.2 **4 Claims**

A vapor phase process was developed which comprises contacting a lactone containing from 4 to 12 carbon atoms

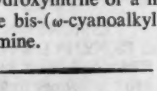
in its ring structure, preferably ε-caprolactone, with ammonia in the presence of a modified alumina and at a temperature of from about 25° C. to 350° C. to produce an ω-hydroxynitrile and/or a bis-(ω-cyanoalkyl) ether. A liquid phase process was developed which comprises contacting an ω-hydroxynitrile or a bis-(ω-cyanoalkyl) ether with hydrogen in the presence of a hydrogenation catalyst, at a temperature of from about 20° C. to about 120° C. and at a pressure of from about 500 p.s.i.g. to about 2000 p.s.i.g. to hydrogenate the cyano groups to amine groups. In a further liquid phase step, the ω-hydroxyamine so produced can be further contacted with hydrogen and ammonia in the presence of a hydrogenation catalyst, at a temperature of from about 200° C. to about 300° C. and at a pressure of from about 2000 p.s.i.g. to about 7000 p.s.i.g. to produce the α,ω-alkylene diamine. This last-mentioned liquid phase step can be performed directly on the ω-hydroxynitrile or a mixture of the ω-hydroxynitrile and the bis-(ω-cyanoalkyl) ether to produce the α,ω-alkylenediamine.

3,560,551
PROCESS FOR PREPARING SUBSTITUTED NITRILOMONOACETAMIDES
Melville E. D. Hillman, Summit, N.J., assignor to W. R. Grace & Co.
No Drawing. Continuation-in-part of application Ser. No. 719,250, Apr. 5, 1968. This application Oct. 10, 1968, Ser. No. 766,622
Int. Cl. C07c *121/02, 121/16, 121/20*
U.S. Cl. 260—465.4 **10 Claims**

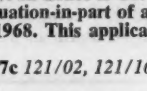
This invention is directed to; (a) a nitriloamide having the formula



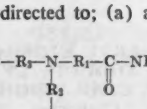
or



wherein, each of R_1, R_2, and R_3 is separately an alkylene radical having about 1–20 carbon atoms, and R_4 is an alkyl radical having about 1–20 carbon atoms; and (b) to a process for preparing said nitriloamides, said process comprising heating a nitrile having the formula



or



with hydrogen peroxide, all as described hereinafter. These products have two nitrile groups and can be polymerized with diamines to form polyamides useful as flocculating agents in water purification and sewage treatment; as intermediates for making polyamides with acid side groups, as antistatic compounds and as textile finishes.

3,560,552
3-OXYGENATED 2-METHYL-5-OXOCYCLOPENT-1-ENEHEPTANOIC ACIDS AND ESTERS THEREOF
Masateru Miyano, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.
No Drawing. Filed Oct. 28, 1968, Ser. No. 771,300
Int. Cl. C07c *61/36, 69/74*
U.S. Cl. 260—468 **10 Claims**

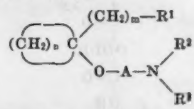
The condensation of 3-oxoundecane-1,11-dioic acid with pyruvic aldehyde affords 3-hydroxy-2-methyl-5-oxocyclopent-1-eneheptanoic acid, which is converted to the other novel compounds of this invention by acylation or oxidation of the hydroxy group or by esterification of the carboxylic acid group. These compounds display valuable pharmacological, e.g. anti-inflammatory, properties and are useful also as anti-germinant agents.

3,560,553
MANUFACTURE OF AROMATIC ACID FLUORIDES
William W Prichard, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed May 9, 1968, Ser. No. 728,069
Int. Cl. C07c *63/24, 63/42, 69/78*
U.S. Cl. 260—469 **8 Claims**

Aromatic carboxylic acid fluorides can be made by reacting aromatic sulfonyl halides with carbon monoxide and an alkali metal fluoride in the presence of a catalyst of Ru, Rh or Pd. The reagents should be free of hydrogen and substituents or substances which can be dehydrogenated under the conditions of the reaction to yield hydrogen. The aromatic acid fluorides are useful as analytical reagents and for the production of polyamide or polyester polymers.

3,560,554
ALKYLAMINOALKYL ETHERS OF CYCLOALKANOL
Zoltán Budai, László Pallos, Endre Komlós and Lujza Erdélyi, née Petöcz, Budapest, Hungary, assignors to Egyesult Gyogyszer-es Tapszergyar, Kereszturi ut, Budapest, Hungary
No Drawing. Filed June 30, 1967, Ser. No. 650,187
Claims priority, application Hungary, July 6, 1966, EE–1,284
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 **5 Claims**

Compounds of the formula



and their pharmaceutically acceptable acid addition salts, wherein R^1 is hydrogen, phenyl or monochlorophenyl, R^2 is alkyl having from 1 to 4 carbon atoms, R^3 is hydrogen or —$COOR^4$, R^4 is lower alkyl, A is alkylene having from 2 to 4 carbon atoms, *n* is an integer from 4 to 6, and *m* is an integer from 0 to 8.

3,560,555
PREPARATION OF 1-(CARBAMOYL)-N-(CARBAMOYLOXY)THIOFORMIMIDATES FROM ALKYL ACETOACETATES
Julius J. Fuchs, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware
No Drawing. Filed Dec. 27, 1968, Ser. No. 787,592
Int. Cl. C07c *161/00*
U.S. Cl. 260—482 **16 Claims**

1 - (carbamoyl) - N - (carbamoyloxy)thioformimidates such as methyl 1-(carbamoyl)-N-(methylcarbamoxyloxy) thioformimidate and methyl 1-(dimethylcarbamoyl)-N-(methylcarbamoyloxy)thioformimidate are prepared by the steps of

(a) reacting an alkyl acetocetate with nitrous acid produced in situ, in the presence of water or alcohol;
(b) chlorinating the product of (a) after cooling to —10 to 40° C.;
(c) reacting the hydroxamoyl chloride formed in (b) with an alkyl mercaptan and then adding a base;
(d) reacting the product of (c) with ammonia or an amine in the presence of water or an alcohol; and
(e) reacting the product of (d) with either
  (1) a carbamoyl chloride, optionally in the presence of a base; or

(2) an isocyanate, optionally in the presence of a basic catalyst, in water or organic solvents such as acetone and methylene chloride.

3,560,556

CYCLIC 2-STAGE METHOD FOR PRODUCING VINYL ACETATE FROM ETHYLENE

William E. Hendrix, Jr., and Robert B. Miinch, Lewiston, N.Y., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Filed June 23, 1967, Ser. No. 648,224

Int. Cl. C07c *67/04*

U.S. Cl. 260—497 **6 Claims**

Vinyl acetate is produced by a cyclic method in which an acetic acid catalyst solution (working solution) containing palladous, acetate, cupric and halide (chloride or bromide) ions is cycled continuously between two separate reaction stages. Ethylene is reacted with the solution in the first stage to produce vinyl acetate and partially reduced catalyst solution from which the vinyl acetate is separated, and the partially reduced solution is reacted with molecular oxygen in the second stage to reoxidize the solution before it is recycled to the first stage. In such a method, cuprous halide, which is precipitated in the solution in the first stage, forms objectionable adherent solid deposits upon equipment surfaces in the first stage. In accordance with the invention, such solid deposits are periodically removed from the first stage equipment surfaces by periodically discontinuing the feed of ethylene to the first stage while continuing the cycling through the first stage equipment of the reoxidized catalyst solution from the second stage.

3,560,557

DIPHENYL-UREAS, -THIOUREAS, -GUANIDINES AND -PARABANIC ACIDS

Adrian Marxer, Muttenz, Switzerland, assignor to Ciba Corporation, New York, N.Y.

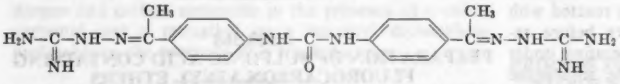
No Drawing. Continuation-in-part of application Ser. No. 594,386, Nov. 15, 1966, which is a continuation-in-part of Ser. No. 589,195, Oct. 25, 1966. This application July 11, 1967, Ser. No. 652,409

Claims priority, application Switzerland, Nov. 19, 1965, 15,988/65; Sept. 29, 1966, 14,092/66

Int. Cl. C07c *127/00*

U.S. Cl. 260—501,14 **9 Claims**

Diguanylhydrazones of diphenyl-ureas, -thioureas, -guanidines and -parabanic acids that contain in each of the two phenyl radicals a meta- or para-positioned alkanecarbonyl group, especially para,para′-diacetyl-diphenylurea-bis-guanylhydrazone of the formula



salts thereof and pharmaceutical compositions containing them display a tumour inhibiting action and act against protozoae and amoebae.

3,560,558

HEXAHYDROINDANE DICARBOXYLIC ACID DERIVATIVES

Shohei Hayakawa, Hyogo, Yoshiko Kanematsu, Kyotoshi, and Takashi Fujiwara, Hyogo, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Continuation-in-part of application Ser. No. 478,735, Aug. 10, 1965. This application Oct. 29, 1968, Ser. No. 771,994

Int. Cl. C07c *61/36*

U.S. Cl. 260—514 **10 Claims**

4α - (2 - carboxyethyl)-5-oxo-(1α-hydrogen- or 1α-hydroxyl) - 7aβ - methyl - 3aα-hexahydroindane-carboxylic acids or lower alkanoic acids, which can be prepared by one-step fermentative degradation of the bile acids or their homologues, are useful as cholesterol lowering agents.

3,560,559

METHOD FOR OXIDIZING o-XYLENE, p-XYLENE AND CYCLOHEXANOL

Alvin L. Benham and Dennis E. Drayer, Littleton, Colo., and Harold D. McBride, Lincoln, Nebr., assignors to Marathon Oil Company, Findlay, Ohio, a corporation of Ohio

Filed Nov. 4, 1964, Ser. No. 408,884

Int. Cl. C07c *63/02*

U.S. Cl. 260—524 **3 Claims**

A process for oxidizing alkyl aromatic or cycloaliphatic hydrocarbons by contacting them with an aqueous solution of ammonium dichromate at elevated temperatures. When the pH of the reaction medium is less than about 7, the product of the reaction is the ammonium salt of an organic carboxylic acid, which, upon acidification, yields the free organic carboxylic acid. When the pH of the reaction medium is above about 7, the oxidation product is the ammonium salt of an organic carboxylic acid amide.

3,560,560

PURIFICATION OF ACETIC ACID

Ben Wilton Kiff, Ona, W. Va., assignor to Union Carbide Corporation

No Drawing. Filed May 8, 1968, Ser. No. 727,732

Int. Cl. C07c *53/08*

U.S. Cl. 260—541 **4 Claims**

Small amounts of formic acid, which are not ordinarily removable by conventional refining procedures, are removed from glacial acetic acid by selective oxidation over a molybdenum-containing catalyst.

3,560,561

CARBONYLATION OF ALLYLIC HALIDES, PHENYLHALIDES AND BENZYL HALIDES IN THE PRESENCE OF ORGANOMETALLIC CATALYTIC AGENTS

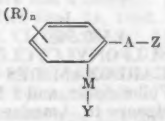
John A. Scheben, Erlanger, Ky., and Irving L. Mador and Milton Orchin, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Filed July 17, 1967, Ser. No. 654,946

Int. Cl. C07c *51/58*

U.S. Cl. 260—544 **7 Claims**

This invention relates to improved methods of carbonylating, dimerizing, hydrogenating and/or isomerizing various unsaturated organic compounds which comprises performing the desired chemical reaction in the presence of a small but effective amount of an organometallic catalytic agent of the formula:



wherein *n* is an integer from 0 to 4; each R is alkyl, aryl, hydroxy, alkoxy, aryloxy, nitro, halo, or a secondary alkyl or arylamino; M is ruthenium, platinum, osmium, palladium, iridium, or rhodium; Y is halide, nitrate, acetate, thiocyanate or cyanide; A is —CR′=N—, (wherein R′ is hydrogen, alkyl or aryl), —NH—NH—,

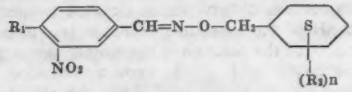
or —N=N—; and Z is alkyl, aryl, R-substituted aryl, (wherein R is as defined hereinabove), alkaryl, alkoxy, aryloxy, hydroxy, alkyl amino, dialkyl amino, aryl amino or diarylamino.

3,560,562
INSECTICIDAL OXIMES

Raymond Giraudon, Thiais, Val-de-Marne, France, assignor to Rhone-Poulenc S.A., Paris, France, a French body corporate

No Drawing. Filed Aug. 15, 1968, Ser. No. 752,804
Claims priority, application France, Aug. 16, 1967, 117,982; May 27, 1968, 153,067
Int. Cl. C07c *131/00*
U.S. Cl. 260—566 **6 Claims**

The oximes of the formula:



where R_1 is hydrogen or lower alkyl and *n* is an integer of 0–4 wherein each R_2 independently represents alkyl of 1–4 carbon atoms, which are new, are valuable insecticides having low toxicity to warm-blooded animals.

3,560,563
2-(p-ALKYLPHENYL)-N-SULFONYLALKANOYL-AMIDES

Scott J. Childress, Philadelphia, and J Lester Szabo, West Chester, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 3, 1969, Ser. No. 830,118
Int. Cl. C07c *143/74, 143/78*
U.S. Cl. 260—556 **4 Claims**

This invention concerns 2-(p-alkylphenyl)-N-sulfonyl-alkanoyl-amides which are pharmacologically active as anti-inflammatory agents and are also substantially non-irritating to the gastrointestinal tract upon oral administration.

3,560,564
HYDROXYALKYLUREA PROCESS

Ludo K. Frevel and Jo Ann Gilpin, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

No Drawing. Filed Oct. 14, 1968, Ser. No. 767,527
Int. Cl. C07c *127/00*
U.S. Cl. 260—553 **5 Claims**

In a process for making a hydroxyalkylurea by reacting urea with an alkanolamine at 100–170° C. and recycling reaction byproducts to the process, better overall yields are obtained when the byproduct fraction is reacted with ammonia at about the process temperature before recycling. Product quality is improved by operating under essentially anhydrous conditions and in the substantial absence of molecular oxygen.

3,560,565
1-AMINO-N-SULFONYLCYCLOPENTANE-CARBOXAMIDES

Scott J. Childress, Philadelphia, and J Lester Szabo, West Chester, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 3, 1969, Ser. No. 830,154
Int. Cl. C07c *143/74, 143/78*
U.S. Cl. 260—556 **5 Claims**

This invention concerns 1-amino-N-sulfonylcyclopentane-carboxamides which are pharmacologically active as immunosuppressive agents and are substantially non-irritating to the gastrointestinal tract upon oral administration.

3,560,566
DIPHENYL-UREAS, -THIOUREAS, -GUANIDINES AND -PARABANIC ACIDS

Adrian Marxer, Muttenz, Switzerland, assignor to Ciba Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 589,195, Oct. 25, 1966. This application Nov. 15, 1966, Ser. No. 594,386
Claims priority, application, Switzerland, Nov. 19, 1965, 15,988/65; Sept. 29, 1966, 14,092/66
Int. Cl. C07d *129/08*
U.S. Cl. 260—565 **4 Claims**

Diguanylhydrazones of diphenyl-ureas, -thioureas, -guanidines and -parabanic acids that contain in each of the two phenyl radicals a meta- or para-positioned alkanecarbonyl group, above all corresponding diphenyl-ureas, -thioureas, -guanidines and -parabanic acids that contain in each phenyl radical a meta- or para-positioned alkanecarbonyl-guanylhydrazone grouping of the formula

in which G represents a guanidino group and R a lower alkyl radical preferably a methyl, ethyl, propyl, butyl or pentyl radical, and their salts. These compounds may contain further substituents. They possess tumour inhibiting action and act against protozoae and amoebae, especially against trypanosomes, for example, against Trypanosoma gambiense and Trypanosoma congolense.

3,560,567
p-HALO- AND p-NITRODIALKYLAMINO-ALKOXYBENZOPHENONES

Rudolf Rüegg, Bottmingen, Gottlieb Ryser, Basel, and Ulrich Schwieter, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Application June 27, 1967, Ser. No. 649,093, which is a continuation-in-part of applications Ser. No. 530,790, Mar. 1, 1966, and Ser. No. 561,709, June 30, 1966. Divided and this application June 20, 1969, Ser. No. 835,228
Claims priority, application Switzerland, Mar. 12, 1965, 3,494/65; June 30, 1966, 9,503/66; Sept. 27, 1966, 14,022/66
Int. Cl. A61k *27/00;* **C07c** *91/30, 91/32*
U.S. Cl. 260—570 **24 Claims**

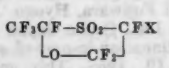
p-Halo-p′-dialkylaminoalkoxybenzophenone derivatives and p-nitro-p′-dialkylaminoalkoxybenzophenone derivatives which have antitubercular properties and are employed as intermediates for dibenzophenone acetylide derivatives which have anthelmintic properties.

3,560,568
PREPARATION OF SULFONIC ACID CONTAINING FLUOROCARBON VINYL ETHERS

Paul Raphael Resnick, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,235
Int. Cl. C07c *143/16*
U.S. Cl. 260—513 **1 Claim**

Vinyl ethers of the formula $CF_2{=}CFOCF_2CFXSO_3Me$, wherein X is F or CF_3 and Me is alkali metal, are made by contacting and reacting an alkali metal alkoxide with a compound of the formula



in an inert organic solvent. The vinyl ether reaction products can be copolymerized with fluorocarbon monomers, e.g., tetrafluoroethylene, to form ionically conductive material for use as fuel cell membranes.

3,560,569
PREPARATION OF GALLIC ACID
Charles D. Hurd, Evanston, Ill., assignor to Commercial Solvents Corporation, New York, N.Y.
No Drawing. Filed Nov. 8, 1967, Ser. No. 681,566
Int. Cl. C07c *65/02*
U.S. Cl. 260—521 **2 Claims**
A process for the preparation of gallic acid by condensing tricarballylic ester and an acetal of mesoxalic ester and hydrolyzing same.

3,560,570
PROCESS FOR PREPARING VINYLSULFONYLETHYLAMINO COMPOUNDS
George F. Wright, Toronto, Ontario, Canada, and John Irvin Dale III, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y., a corporation of New Jersey
No Drawing. Filed May 17, 1967, Ser. No. 639,042
Int. Cl. C07c *85/00, 89/00, 99/00*
U.S. Cl. 260—577 **4 Claims**
Process for the preparation of vinylsulfonylethylamino compounds and quaternary intermediates employed in such process by the quaternization of a 4-phenylthiomorpholinedioxide and contacting the quaternary intermediate with base.

3,560,571
NOVEL PHOTOCHEMICAL REACTION OF 4-CARANONE AND NOVEL REACTION PRODUCTS RESULTING THEREFROM
Paul J. Kropp, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio, a corporation of Ohio
No Drawing. Filed May 29, 1967, Ser. No. 642,235
Int. Cl. C07c *49/27, 49/28*
U.S. Cl. 260—586 **6 Claims**
Photochemical reaction of 4-caranone to obtain the novel compounds, 2-(2′-methyl-2′-but-3′-enyl) - 4 - methylcyclobutanone and 2,2,5-trimethyl - 3 - vinylcyclopentanone, and the process of converting 3-carene to 4-caranone by epoxidizing 3-carene and, subsequently, treating that product with a Lewis acid catalyst.

3,560,572
PROCESS
John F. Deffner, Glenshaw, Edmond R. Tucci, Pittsburgh, and John V. Ward, Oakmont, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa., a corporation of Delaware
No Drawing. Filed Aug. 23, 1966, Ser. No. 574,320
Int. Cl. C07c *45/10*
U.S. Cl. 260—604 **15 Claims**
An Oxo process wherein an olefin is reacted with hydrogen and carbon monoxide in the presence of a cobalt carbonyl and a tetraalkyl or a tetraaryl diphosphine, preferably in the presence of a trialkyl amine.

3,560,573
PROCESS FOR THE PRODUCTION OF PENTACHLOROTHIOPHENOL
Manfred Blazejak, Dusseldorf, and Josef Haydn, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany, a corporation of Germany
No Drawing. Filed June 25, 1968, Ser. No. 739,660
Claims priority, application Germany, July 1, 1967, F 52,839
Int. Cl. C07c *149/34*
U.S. Cl. 260—609 **4 Claims**
Pentachlorothiophenol produced from hexachlorobenzene, sodium sulphide and sulphur in a lower aliphatic alcohol reaction medium is recovered from aqueous solution by the addition of an ammonium salt and a wetting agent.

3,560,574
PROCESS FOR THE PREPARATION OF OXYALCOHOLS AND OXYKETONES
Orville D. Frampton, Julian Feldman, and Charles E. Frank, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.
No Drawing. Filed Jan. 8, 1969, Ser. No. 789,938
Int. Cl. C07c *43/04, 43/20, 43/18*
U.S. Cl. 260—615 **7 Claims**
A process is provided for the preparation of oxyalcohols and oxyketones by the trihydrocarbyl phosphine-catalyzed reaction of epoxides and monohydric alcohols.

3,560,575
PREPARATION OF NITROALCOHOL
John B. Tindall, Terre Haute, Ind., assignor to Commercial Solvents Corporation, a corporation of Maryland
No Drawing. Filed Sept. 7, 1966, Ser. No. 577,592
Int. Cl. C07c *71/10, 79/18, 91/06*
U.S. Cl. 260—635 **4 Claims**
Nitroalcohols are produced by reacting a nitroparaffin with a stoichiometric excess of formaldehyde, said excess being from about 5 to 60% equivalents, deionizing the reaction product thereof to remove the metal ion of said catalyst, fractionating said deionized reaction product with methanol in the presence of a mineral acid, toluene sulfonic acid or cation exchange resin in an amount sufficient to catalyze the reaction of the excess of the formaldehyde and methanol, the methanol being used in an amount sufficient to react with the aldehyde remaining in said fractionated product, and removing the reaction product of said formaldehyde and methanol from the resulting mixture.

3,560,576
ETHYNYLATION OF FORMALDEHYDE
Jack R. Kirchner, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware
No Drawing. Filed Oct. 23, 1967, Ser. No. 677,020
Int. Cl. C07c *33/04;* **B01j** *11/00*
U.S. Cl. 260—635 **12 Claims**
Particulate catalysts, consisting essentially of cuprous acetylide complexes containing at least 1.75 carbon atoms per copper atom, and having a total surface area of at least 5.0 square meters per gram, are prepared at 50–120° C. by the simultaneous action of formaldehyde and acetylene at a partial pressure of less than 2.0 atmospheres on cupric compounds slurried in substantially neutral aqueous media and used to catalyze ethynylation in a continuous stirred reaction at 60–120° C. and acetylene partial pressures below 2.0 atmospheres.

3,560,577
PROCESS FOR MAKING REACTION PRODUCTS OF NITROUS ACID AND 1,3-DICHLOROBUTENE-2 OR DIISOBUTYLENE
Edwin Benjamins, Montague, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Sept. 18, 1968, Ser. No. 760,695
Int. Cl. C07c *81/00, 81/02*
U.S. Cl. 260—647 **4 Claims**
Reaction products of nitrous acid and 1,3-dichlorobutene-2 or diisobutylene, useful as inhibitors of "popcorn" polymer formation in chloroprene polymerization reactions, are made by a controllable process comprising (1) adding an alkali or alkaline earth metal nitrite to liquid 1,3-dichlorobutene-2 or diisobutylene with agitation, (2) slowly adding concentrated hydrochloric or sulfuric acid to the mixture so obtained, and (3) recovering a reaction product of nitrous acid and 1,3-dichlorobutene-2 or diisobutylene from the by-product alkali or alkaline earth metal salt formed.

3,560,578

REACTION FOR LINKING NUCLEI OF ADAMANTANE HYDROCARBONS

Abraham Schneider, Overbrook Hills, Pa., assignor to Sun Oil Company, Philadelphia, Pa., a corporation of New Jersey

No Drawing. Continuation-in-part of application Ser. No. 725,888, May 1, 1968, which is a continuation-in-part of application Ser. No. 649,810, June 29, 1967. This application May 8, 1969, Ser. No. 823,138

Int. Cl. C07c *17/00, 23/18*

U.S. Cl. 260—648 **23 Claims**

New products having adamantane nuclei linked through either a C_3 or C_4 polymethylene linkage are prepared by reacting adamantane or alkyladamantanes with a C_3–C_4 alkyl chloride or bromide at —20° C. to 50° C. using $AlCl_3$ or $AlBr_3$ as catalyst. Preferably primary or secondary C_3–C_4 alkyl halides are used as the reactant. Reaction conditions are such that the catalyst is maintained in solution in the reaction mixture. Bis-type products containing two linked adamantane nuclei and 0–2 halogen atoms substituted at bridgehead positions can be obtained, as well as polymers which can be linear or cross-linked. The products have various utilities, such as in compositions for coating, investment casting, caulking and potting, in adhesive compositions, as chromatographic separation media, and as thermostatic actuating elements.

3,560,579

PROCESS FOR PREPARING META-HALOTOLUENE

John D. Bacha, Monroeville, and Charles M. Selwitz, Pitcairn, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa., a corporation of Delaware

No Drawing. Filed Dec. 20, 1968, Ser. No. 785,793

Int. Cl. C07c *25/00, 25/04*

U.S. Cl. 260—650 **11 Claims**

A process for isomerizing ortho-halotoluene or para-halotoluene to meta-halotoluene which involves contacting the ortho-halotoluene or para-halotoluene with hydrogen fluoride, boron trifluoride and halobenzene.

3,560,580

PREPARATION OF BROMINATED STYRENE

George A. Burk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

No Drawing. Filed Jan. 2, 1969, Ser. No. 788,612

Int. Cl. C07c *25/04, 25/28*

U.S. Cl. 260—650 **7 Claims**

Ring-brominated styrenes are prepared by passing a mixture of ethylbromobenzene and bromine through a heated zone at a temperature between 600° and 700° C. to produce ring-brominated styrenes in good yield.

3,560,581

PROCESS FOR UPGRADING CHLORINATED HEAVY RESIDUES

Albert Antonini, Paris, Maurice Goharel, Saint-Auban, Basses-Alpes, and Georges Wetroff, Le Thillay, Seine-et-Oise, France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France

No Drawing. Continuation-in-part of application Ser. No. 354,786, Mar. 25, 1964. This application July 25, 1967, Ser. No. 655,767

Int. Cl. C07c *17/34*

U.S. Cl. 260—654 **7 Claims**

A process for upgrading chlorinated heavy residues resulting from the production of chlorinated hydrocarbons which include chlorobenzenes of the type tetra-, penta- and hexachlorobenzene, hexachlorobutadiene, hexachloroethane and tar-like products by mixing the residue with a compound capable of fixing free chlorine and advancing the mixture in a vapor state and in turbulent flow through a reaction zone at a rate sufficient to give a Reynolds mean-value number in excess of 2000 with the reaction zone having a total internal surface to cross-section ratio in excess of 500, supplying the vapor to the reaction zone at a pressure in excess of 1 kg./cm.^{2}, and heating the mixture to a temperature within the range of 440–550° C. during passage through the reaction zone.

3,560,582

NOVEL POLYCYCLIC COMPOSITIONS AND PROCESS FOR PREPARATION

Gerhard F. Schroder, Karlsruhe, Germany

No Drawing. Continuation of application Ser. No. 411,127, Nov. 13, 1964, which is a continuation-in-part of application Ser. No. 348,284, Feb. 28, 1964. This application June 6, 1969, Ser. No. 834,587

Int. Cl. C07c *3/00, 13/00*

U.S. Cl. 260—666 **1 Claim**

A novel class of tricyclo [3.3.2.$0^{4,6}$]deca-2,7,9-trienes is prepared by the irradiation of a dimer of cyclo-octatetraene to obtain tricyclo[3.3.2.$0^{4,6}$]deca-2,7,9-triene from which other derivatives are then synthesized.

3,560,583

PROCESS OF PREPARING SUBSTITUTED CYCLOPENTADIENES

Clare Augustus Stewart, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 15, 1969, Ser. No. 825,039

Int. Cl. C07c *3/00*

U.S. Cl. 260—666 **10 Claims**

Substituted cyclopentadienes are prepared by reacting a cyclopentadiene compound with an alkali metal hydroxide and a substituted alkyl halide in the presence of a quaternary ammonium salt catalyst.

3,560,584

PROCESS FOR DEALKYLATING HYDROCARBONS

Pierre Duhaut, Le Vesinet, and Jean Francois Le Page, Rueil Malmaison, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil Malmaison, Hauts-de-Seine, France

No Drawing. Filed Dec. 13, 1968, Ser. No. 783,708

Claims priority, application France, Dec. 20, 1967, 133,224

Int. Cl. C07c *3/58;* **B01j** *11/06*

U.S. Cl. 260—672 **7 Claims**

A process for hydrodealkylating alkylaromatic hydrocarbons which consists of passing said hydrocarbons over a catalyst in the presence of hydrogen, said catalyst composed of 1 to 20% by weight of compounds of metals from Group I–A and 0.01 to 5% by weight of compounds of metals from Group VI–A deposited on an alumina, said alumina having a specific surface between 40 and 120 m.^{2}/g., a porous volume between 0.4 and 0.8 cc./g., and more than 75% of the porous volume corresponding to pores having a diameter between 100 and 2,000 A., said alumina also exhibiting a substantially null acidity.

3,560,585

CRYSTALLIZATION PROCESS

Regis Lafay, Suresnes, France, and Friedrich Wiegandt, Ithaca, N.Y., assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil Malmaison, France

Filed Jan. 17, 1968, Ser. No. 698,618

Claims priority, application France, Jan. 23, 1967, 92,199

Int. Cl. C07c *7/14*

U.S. Cl. 260—674 **15 Claims**

A process for selectively crystallizing one of the constituents of a liquid feed mixture containing several con-

stituents and an apparatus for performing the crystallization process. The process comprises passing a feed mixture and an immiscible cooling liquid in countercurrent contact to each other, to cause crystallization of the constituent in the feed mixture. The crystals are passed to a purification zone suspended in melted crystals which were used to wash other crystals in the purification zone.

3,560,586

PROCESS FOR DECOMPOSING 4,4-DIMETHYL-m-DIOXANE INTO ISOPRENE

Walter Kronig, Leverkusen, Wulf Schwerdtel, Cologne-Stammheim, Paul Losacker, Leichlingen, and Bodo Weicht, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed June 10, 1969, Ser. No. 832,002

Claims priority, application Germany, Nov. 29, 1968, P 18 11 655.7

Int. Cl. B01j *11/82;* **C07c** *1/20, 1/100*

U.S. Cl. 260—681 **7 Claims**

4,4-dimethyl-m-dioxane is decomposed into isoprene in the gaseous phase in a fluidized bed over a catalyst containing phosphoric acid and prepared by suspending a silicic acid filler having a specific surface of 30 to 200 $m.^2/g.$ and a kaolinite, montmorillonite or attapulgite clay in an aqueous stable silicic acid sol having a specific surface area of 150 to 400 $m.^2/g.$ (dry basis); adding to the resulting suspension a sufficient amount of an aqueous suspension of magnesium oxide to set the suspension into beads; drying the beads; heating the beads to 500 to 1,000° C. for at least 10 minutes; adding thereto 5 to 30% phosphoric acid; and further heating them to 300 to 650° C.

3,560,587

HYDROGEN FLUORIDE ALKYLATION WITH REACTION COOLER AND REACTION SOAKER VESSELS

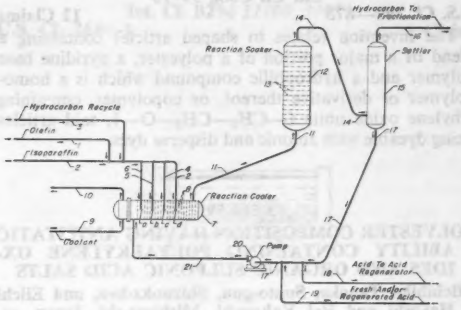
William B. Borst, Jr., Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill., a corporation of Delaware

Filed Apr. 14, 1969, Ser. No. 815,841

Int. Cl. C07c *3/54*

U.S. Cl. 260—683.48 **8 Claims**

An isoparaffin and olefin admixture is passed into a reaction cooler equipped with internally placed heat exchange means and spaced baffle means; the admixture is contacted with hydrogen fluoride alkylation catalyst under isothermal reaction conditions and the reaction effluent is then passed into a reaction soaker equipped with a number of spaced perforated plates therein where further alkylation takes place. The use of reaction cooler and reaction soaker vessels provides improved control of the reaction temperature and more complete alkylation reaction.



3,560,588

3-AZABICYCLO[3.2.2]NON-3-YLTHIOCARBONYL DISULFIDES

John Joseph D'Amico, Dunbar, and Eiichi Morita, St. Albans, W. Va., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

No Drawing. Filed Jan. 30, 1968, Ser. No. 701,559

Int. Cl. C08f *27/06;* **C07d**

U.S. Cl. 260—793 **7 Claims**

Compounds of the formula

$$R_1-\overset{\overset{S}{\|}}{C}-S-S-R_2$$

where R_1 and R_2 are amino radicals of one to sixteen carbon atoms selected from the group consisting of alkylamino, dialkylamino, and heterocyclicamino, at least one of R_1 and R_2 being 3-azabicyclo[3.2.2]non-3-yl, and their use for accelerating vulcanization of rubber are described.

3,560,589

EPOXY RESIN CONTAINING A VINYL ALKOXYSILANE-ETHYLENICALLY UNSATURATED ACID ANHYDRIDE COPOLYMER

Yasuhiko Sato, Shiro Gomyo, and Kiyoshi Imai, Gunmaken, Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

No Drawing. Filed July 10, 1968, Ser. No. 743,840

Claims priority, application Japan, July 12, 1967, 42/44,856

Int. Cl. C08g *45/04*

U.S. Cl. 260—824 **9 Claims**

Compositions which consist of

(a) a copolymer prepared by reacting vinylalkoxysilane containing at least one alkoxy group with an ethylenically unsaturated carboxylic acid anhydride, and

(b) an epoxy resin or a monomer containing an epoxy group, in the ratio of from 0.2 to 100 parts by weight of (a) to 100 parts by weight of (b).

3,560,590

DYEABLE POLYESTER COMPOSITION

Andor Schwarcz, Pompton Lakes, Milton Farber, Verona, and Phillip J. Cangelosi, Garfield, N.J., assignors to Uniroyal, Inc., New York, N.Y., a corporation of New Jersey

No Drawing. Filed Feb. 14, 1968, Ser. No. 705,293

Int. Cl. C08g *39/10*

U.S. Cl. 260—873 12 Claims

The invention relates to shaped articles containing a blend of a major portion of a polyester, a pyridine base polymer and a hydrophilic compound which is a homopolymer or derivative thereof, or copolymer, containing ethylene oxide units (—CH_2—CH_2—O—), said articles being dyeable with anionic and disperse dyes.

3,560,591

POLYESTER COMPOSITION HAVING ANTISTATIC ABILITY CONTAINING POLYALKYLENE OXIDES AND ORGANIC SULFONIC ACID SALTS

Michihiko Tanaka, Sunto-gun, Shizuokz-ken, and Eiichi Hayashi and Rei Yokouchi, Mishima-shi, Japan, assignors to Toyo Rayon Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed May 9, 1967, Ser. No. 637,064

Claims priority, application Japan, May 13, 1966, 41/30,005; June 20, 1966, 41/39,609

Int. Cl. C08g *39/10*

U.S. Cl. 260—860 12 Claims

A polyester composition with an excellent antistatic property comprising polyester in which are incorporated at least one polyalkylene ether substantially insoluble in the polyester and at least one alkali metal salt or alkaline earth metal salt of an organic sulfonic acid having no ester-forming group. Among these salts, dodium salts, potassium salts and calcium salts of alkylbenzenesulfonic acids, alkyldiphenylether sulfonic acids and alkylphenoxyalkane sulfonic acids are preferable.

3,560,592

CHLORINATED POLYVINYL CHLORIDE AND ETHYLENE/ACRYLATE COPOLYMER COMPOSITIONS

Pierre Decroly and Ghislain Danguy, Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium, a corporation of Belgium

No Drawing. Filed Aug. 10, 1967, Ser. No. 659,612

Claims priority, application France, Aug. 16, 1966, 73,146; June 21, 1967, 111,315

Int. Cl. C08f *29/12*

U.S. Cl. 260—876 12 Claims

The processability and impact strength of chlorinated polyvinyl chloride alone or in combination with polyvinyl chloride are improved by the addition of a copolymer of ethylene and an alkyl ester of acrylic acid or a substitution derivative of acrylic acid. Further improvement in impact strength is obtained by the further addition also of certain modifying agents which are graft copolymers based on diolefin polymers or copolymers or certain two or three component interpolymers.

3,560,593

PRODUCTION OF BLOCK COPOLYMERS

Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company, a corporation of Delaware

No Drawing. Filed Jan. 2, 1968, Ser. No. 694,809

Int. Cl. C08f *15/04*

U.S. Cl. 260—880 3 Claims

Rubbery block copolymers of conjugated dienes and monovinyl-substituted aromatic compounds are made in the presence of a cyclopentyllithium initiator by first charging one of the monomers and allowing it to polymerize to substantially complete conversion of monomer into polymer, adding a dissimilar monomer to the first formed reaction mixture and allowing it to polymerize to substantially complete conversion and finally adding the remaining monomer which is dissimilar to the second monomer. Block copolymers prepared by this method have high green tensile strength.

3,560,594

DYE-RECEPTIVE POLYOLEFIN COMPOSITIONS

Alberto Bonvicini and Giuseppe Cantatore, Terni, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

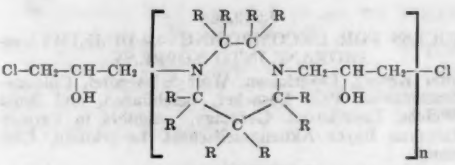
No Drawing. Original application May 22, 1967, Ser. No. 640,336, now Patent No. 3,510,437, dated May 5, 1970. Divided and this application Aug. 19, 1969, Ser. No. 851,433

Claims priority, application Italy, May 27, 1966, 12,363/66

Int. Cl. C08f *41/12*

U.S. Cl. 260—897 3 Claims

Dye-receptive compositions, preferably in the form of textile fibers, comprising 1–25% by weight of a basic nitrogen polycondensate obtained by reacting the condensation product of epichlorohydrin and a heterocyclic seven-membered disecondary diamine, this condensation product having the formula:



wherein R radicals are the same or different radicals selected from the group consisting of hydrogen and alkyl radicals having 1–12 carbon atoms, and *n* is an integer from 1 through 100, with a polyamine containing primary amino groups of the type

$$R—HN \ldots X \ldots NH_2$$

Where R is H, an alkyl group or a residue of a heterocyclic nucleus and X is a residue of a bivalent hydrocarboon, optionally containing S, N, O, etc., for example, hexamethylenediamine, ethylenediamine, diethylenetriamine, tetraethylenepentamine, aminoethylpiperazine N-methylhexamethylenediamine, N-isopropylhexamethylenediamine, 3,3 - diaminodipropylether, 3,3' - diaminodiphenylmethane, N,N'-bis - (3 - amino-propyl) piperazine, and the like; ad, correspondingly, 99–75% by weight of a synthetic polymer, e.g., a polyolefin.

3,560,595

FLUOROELASTOMER SEALANTS

Leslie Nathan Phillips, Farnborough, and David Kenneth Thomas and George Wood, Farnham, Surrey, England, assignors to Minister of Aviation in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

No Drawing. Filed Aug. 1, 1966, Ser. No. 569,063

Claims priority, application Great Britain, Aug. 3, 1965, 33,119/65; Nov. 30, 1965, 50,766/65

Int. Cl. C08f *29/22*

U.S. Cl. 260—900 8 Claims

A curable sealant composition is provided comprising a fluorohydrocarbon elastomer having an average

molecular weight less than about 20,000 and containing a sufficient amount of unsaturated carbon-carbon linkages to cure the sealant composition, a fluorohydrocarbon elastomer having an average molecular weight greater than about 40,000, and a suitable curing agent. Such sealant compositions have the advantage that they are readily extrudble, can be applied without solvent, or with the application of relatively little solvent and also may be cured in situ by heating at moderate temperatures for reasonable periods of time, say at less than 200° C. for less than 24 hours.

3,560,596

O-ALKYL S-PHENYL BENZYLPHOSPHONOTHIOLATES

Seiichi Hirane, Masahiro Aya, and Shigeo Kishino, Tokyo, Japan, assignors to Nihon Tokushu Noyaku Seizo Kabushiki Kaisha, Tokyo, Japan, a corporation of Japan, and Farbenfabriken Bayer Aktiengesellschaft, Leverkusen-Bayerwerke, Germany, a corporation of Germany

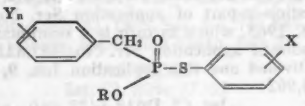
No Drawing. Filed Jan. 22, 1968, Ser. No. 699,296

Claims priority, application Japan, Jan. 28, 1967, 42/5,710; Apr. 17, 1967, 42/24,342

Int. Cl. A01n *9/36;* **C07f** *9/40, 9/42*

U.S. Cl. 260—951 **24 Claims**

Agricultural and horticultural fungicides, especially useful for the control of microorganisms which breed diseases of rice, comprising organic phosphothiolates not containing heavy metals harmful to men and cattle, and the ingredients represented by the following Formula I



(I)

wherein R stands for a member selected from the group consisting of alkyl groups having 1–4 carbon atoms, X stands for a member selected from the group consisting of hydrogen atom, chlorine atom and methyl group, Y stands for a member selected from the group consisting of hydrogen atom, chlorine atom, alkyl groups having 1–4 carbon atoms and alkoxy groups and *n* is a number selected from the group consisting of zero, 1 and 2.

3,560,597

PROCESS FOR PREPARING DIALKYL THIOPHOSPHITES

Donald N. Bernhart and Daniel F. Simmons, Mount Pleasant, Tenn., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Nov. 7, 1968, Ser. No. 774,167

Int. Cl. C07f *9/16*

U.S. Cl. 260—981 **6 Claims**

A process for the preparation of dialkyl thiophosphites by the reaction of P_4S_7 and an alcohol in a molar ratio of at least about 1 to 8 and recovering the product by treating the reaction mixture with water having a temperature of less than about 40° C. in an amount sufficient to contain the water soluble impurities, separating the aqueous phase from the organic phase and distilling the organic phase to recover the dialkyl thiophosphite.

3,560,598

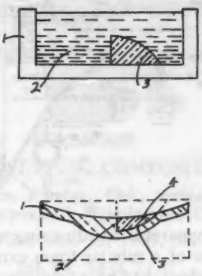
PROCESS FOR MAKING PLASTIC MULTIFOCAL LENSES

Charles W. Neefe, Box 361, Big Spring, Tex. 79720

Continuation-in-part of application Ser. No. 570,107, July 11, 1966. This application Oct. 11, 1968, Ser. No. 766,817

Int. Cl. B29d *11/00, 3/00*

U.S. Cl. 264—1 **1 Claim**



A method for making monocentric bifocal contact lenses. The reading segment being composed of a material possessing a higher index of refraction than the material of the lens and being semi-circular in shape and the optical center of the reading segment located at the center of the upper straight edge of the semicircular reading segment.

3,560,599

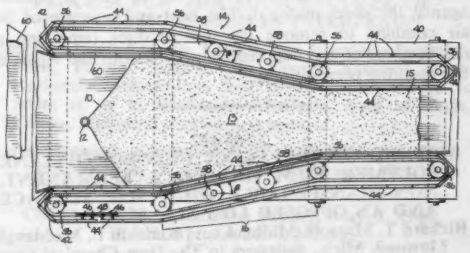
METHOD OF REGULATING THE UPPER SURFACE CONTOUR OF POLYURETHANE FOAM

Charles Ferstenberg, Paramus, N.J., assignor to Tenneco Chemicals, Inc., New York, N.Y., a corporation of Delaware

Filed Aug. 5, 1968, Ser. No. 750,034

Int. Cl. B29d *27/04*

U.S. Cl. 264—41 **13 Claims**

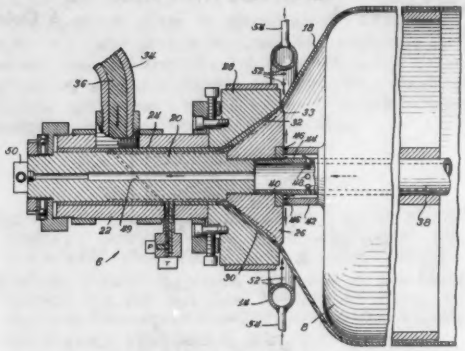


Control of upper contour of foamed polyurethane materials formed in an open top mold by selective control of lateral pressure to the rising foam by movement of the mold's sides toward one another in a manner decreasing the overall width of said foam.

3,560,600
SURFACE TREATMENT ON EXTRUDED PLASTIC FOAM

Vern L. Gliniecki, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

Filed Nov. 7, 1963, Ser. No. 322,088
Int. Cl. B29d *29/00*
U.S. Cl. 264—48 **2 Claims**

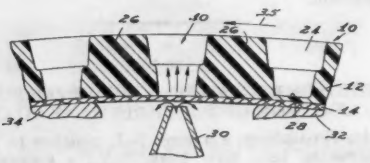


Method and apparatus for directing a cooling medium on opposite sides of a tubular foam extrudate to provide a high quality sheet having exceptionally smooth, high gloss surface free of defects.

3,560,601
PROCESS FOR MANUFACTURING POROUS THERMOPLASTIC SHEET MATERIAL

Harry T. Johnson, Dearborn, and Philip L. Turner, Southfield, Mich., assignors to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

Filed Nov. 25, 1968, Ser. No. 778,435
Int. Cl. B29c *17/00, 17/08, 24/00*
U.S. Cl. 264—93 **7 Claims**



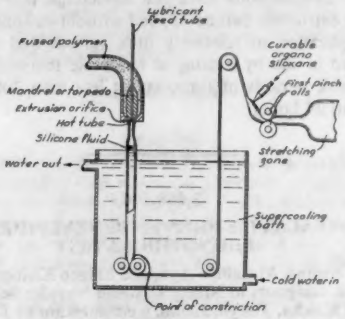
Fabric backed polyvinyl chloride sheet material is passed over an embossing roll containing the desired surface pattern and a plurality of small studs that produce depressions extending through about 80–95% of the polyvinyl chloride film thickness. Heated air then is directed against the sheet material. The heat and pressure of the air combine to remove the thin sections remaining at the bottoms of the depressions and smooth the edges of the resulting perforations.

3,560,602
METHOD OF PREPARING CHLOROETHYLENE POLYMER FILM HAVING A PERMANENT, NON-TRANSFERABLE HIGH SLIP SURFACE AND AN OPPOSED LOW SLIP SURFACE

Richard T. Marzolf, Midland, and Kenneth L. Meddaugh, Linwood, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

Filed July 29, 1968, Ser. No. 748,562
Int. Cl. B29c *17/07;* **B29d** *23/04;* **C08g** *47/00*
U.S. Cl. 264—95 **2 Claims**

This invention relates to a chloroethylene polymer film having a permanent, non-transferable high slip surface and an opposed low slip surface and a method of preparing the same by the continuous application of a curable organosiloxane to the interior surface of a tubular chloroethylene film having a prior coating of a non-curable

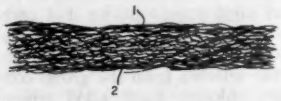


silicone fluid thereon. Such film is particularly suited for use in packaging foodstuffs where a packaging film having an interior, non-transferable high slip surface and an exterior low slip surface is required.

3,560,603
PROCESS FOR PREPARING ACRYLIC FIBERS

James Francis Ryan, Jr., deceased, late of Westover Hills, Va., by First and Merchants National Bank of Virginia, administrator, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Application Sept. 28, 1966, Ser. No. 582,482, which is a continuation-in-part of application Ser. No. 480,730, Aug. 18, 1965, which in turn is a continuation-in-part of abandoned application Ser. No. 307,822, Sept. 10, 1963. Divided and this application Jan. 9, 1969, Ser. No. 790,902
Int. Cl. D01d *5/22*
U.S. Cl. 264—168 **7 Claims**



Low strength acrylic fiber having, upon boil-off, a substantially straight configuration and specific shrinkage, characteristics is disclosed. The fiber is prepared by washing and drawing freshly spun acrylic filaments, and plasticizing them under restraint to relax the filaments. This fiber, combined with high strength, high shrinkage fiber, is used to provide pill-resistant, bulked, composite yarns and fabrics thereof, having excellent aesthetics.

3,560,604
PROCESS FOR MAKING TEXTURED POLYPROPYLENE FILAMENTS

Jon D. Papps, Severna Park, Md., assignor to National Plastic Products Company, Inc., Odenton, Md., a corporation of Maryland

No Drawing. Filed Oct. 25, 1963, Ser. No. 318,842
Int. Cl. D01d *5/22*
U.S. Cl. 264—168 **11 Claims**

Textured polypropylene filaments are produced by cold drawing a highly melt-drawn polypropylene filament at room temperature.

3,560,605

POLYETHYLENE TEREPHTHALATE INJECTION MOLDING COMPOSITIONS CONTAINING A POLYEPOXIDE

Erhard Siggel, Seckmauern, Walter Rein, Obernburg, and Hans-Martin Koepp, Erlenbach, Germany, assignors to Glanzstoff AG, Wuppertal, Germany

No Drawing. Filed Oct. 6, 1967, Ser. No. 673,308

Claims priority, application Germany, Oct. 8, 1966, G 48,116; Mar. 3, 1967, G 49,477

Int. Cl. B29f *1/00*; C08g *45/04, 45/14*

U.S. Cl. 264—328 19 Claims

A polyethylene terephthalate injection molding composition in which there is melt blended and homogeneously distributed a minor amount of the di- or polyepoxide of a dihydric phenol as a modifying agent. The composition, particularly after being subjected to a heat treatment in the regranulated state, is useful for injection molding into articles which are dimensionally stable and resistant to impact. Process steps include admixing, melt blending and regranulating the initial components and further include a subsequent heat treatment of the regranulated product and/or its injection molding into suitable articles.

3,560,606

PROCESS FOR PREPARING DRAWN POLYAMIDE FILMS

Mutsuo Kuga and Kayomon Kyo, Kyoto-shi, Takeshi Mashimo, Uji-shi, Wakuo Matsumura, Hirakata-shi, and Hiroshi Kayama, Uji-shi, Japan, assignors to Nippon Rayon Kabushiki Kaisha (Nippon Rayon Co. Ltd.), Kyoto-fu, Japan, a body corporate of Japan

Filed July 23, 1968, Ser. No. 746,889

Claims priority, application Japan, July 25, 1967, 42/47,768

Int. Cl. B29c *17/02*

U.S. Cl. 264—289 10 Claims

Polyamide film is processed by adding 1 to 6% by weight water, preheating and then biaxially drawing at a temperature at least 5° C. higher than the preheating temperature. During preheating a substantial difference in water content between the interior and surface of the film is created. The films made by this process have a relatively low friction coefficient.

3,560,607

AEROSOL FORMULATIONS OF FINELY DIVIDED SOLID MEDICAMENTS WITH ANIONIC SURFACE-ACTIVE AGENTS

Philip Saxton Hartley, Springfield, Kegworth, England, assignor to Fisons Pharmaceuticals Limited, Loughborough, Leicestershire, England

No Drawing. Continuation-in-part of application Ser. No. 324,222, Nov. 18, 1963. This application July 5, 1968, Ser. No. 742,521

Int. Cl. A61c *27/00*

U.S. Cl. 424—46 5 Claims

Aerosol formulations are provided comprising a finely divided solid medicament, a propellant, and an anionic surface-active agent selected from the group consisting of alkali metal, ammonium and amine salts of dialkyl sulphosuccinic acids wherein the alkyl groups contain from 4 to 12 carbon atoms, and alkali metal, ammonium and amine salts of alkylbenzene sulphonic acids wherein the alkyl groups contain from 8 to 14 carbon acids.

3,560,608

ORAL COMPOSITIONS FOR CARIES AND CALCULUS PROPHYLAXIS

William J. Griebstein, Mount Healthy, Robert J. Grabenstetter, Colerain Township, Hamilton County, and James S. Widder, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio, a corporation of Ohio

No Drawing. Continuation-in-part of application Ser. No. 805,853, Mar. 10, 1969, which is a continuation-in-part of application Ser. No. 605,614, Dec. 29, 1966.

This application Mar. 17, 1969, Ser. No. 807,974

Int. Cl. A61r *7/16*

U.S. Cl. 424—49 3 Claims

Oral compositions containing stannous salts of certain polyphosphonic acids as a source of stable and dental enamel reactive stannous tin and as anticalculus agents.

3,560,609

HAIR-SETTING COMPOSITION

Maria A. Korden, Fairfax, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Oct. 13, 1967, Ser. No. 675,023

Int. Cl. A61k *7/10*

U.S. Cl. 424—72 9 Claims

A hair-setting lotion is provided which is comprised of an aqueous solution of a reaction product of a water-soluble alkylene polyamineepichlorohydrin resin and a water-soluble material such as sodium sulfite.

3,560,610

HAIR-SETTING COMPOSITION

Maria A. Korden, Fairfax, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Oct. 13, 1967, Ser. No. 675,022

Int. Cl. A61k *7/10*

U.S. Cl. 424—72 7 Claims

A hair-setting lotion is provided which is comprised of an aqueous solution of a reaction product of a water-soluble polyaminoureylene-epichlorohydrin resin and a water-soluble material such as sodium sulfite.

3,560,611

PROCESS FOR THE MANUFACTURE OF PREPARATIONS RICH IN INTERFERON

Charles Chany, Ernesto, Falcoff, and Francoise Fournier, Paris, France, assignors to Centre National de la Recherche Scientifique, and Institut National de la Sante et de la Recherche Medicale, both of Paris, France, fractional part interest to each

No Drawing. Continuation of application Ser. No. 635,356, May 2, 1967. This application Oct. 27, 1969, Ser. No. 869,942

Claims priority, application France, May 2, 1966, 59,921; Apr. 14, 1967, 102,803

Int. Cl. A61k *17/00, 23/00*; C12k *9/00*

U.S. Cl. 428—85 7 Claims

The invention provides a process for the manufacture of interferon-rich preparations by incubating human cells in the presence of an induction agent such as a virus, and separating the interferon formed.

3,560,612

METHOD OF ALLEVIATING HYPERCITRICEMIA

Toshiharu Matsumura, Nara, and Akira Tsunemitsu, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Application Jan. 16, 1969, Ser. No. 797,333, which is a continuation of application Ser. No. 583,418, Sept. 30, 1966. Divided and this application Oct. 10, 1969, Ser. No. 870,917

Claims priority, application Japan, Sept. 30, 1965, 40/60,094

Int. Cl. A61k *19/00*

U.S. Cl. 424—94 6 Claims

This invention relates to the administration of ubiquinone 35 (coenzyme Q7) for lowering blood citrate level in patients.

3,560,613

STABILIZATION OF PYRETHROID COMPOSITIONS

Raymond P. Miskus, Orinda, and Theresa Litwin Andrews, Oakland, Calif., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed May 9, 1967, Ser. No. 637,065

Int. Cl. A01n *9/08*

U.S. Cl. 424—174 13 Claims

Pyrethroids, useful as insecticides, are stabilized against deterioration by air and sunlight by incorporating in a liquid petrolatum solution thereof (1) from 0% to 5% of a photo-stable, ultraviolet absorbent compound having a log molar extinction coefficient of not less than about 3.0 in the range of about from 2,000 to 3,200 angstrom units and not more than about 2.0 in the range of about from 4,000 to 7,000 angstrom units, such as amyl para-dimethylaminobenzoate, and (2) from 0% to 5% of an antioxidant, such as 2,6-di-tert butyl para-cresol.

3,560,614

USE OF A KERATOLYTIC SHAMPOO

Paul G. Embring, Uppsala, Sweden, assignor to Aktiebolaget Medisan, Uppsala, Sweden

No Drawing. Filed Jan. 31, 1967, Ser. No. 612,782

Claims priority, application Sweden, Jan. 31, 1966, 1,175/66

Int. Cl. A61k *27/00*

U.S. Cl. 424—234 1 Claim

A shampoo preparation consisting of a mixture comprising salicylic acid, an anionic surface active agent, alkyl esters of phthalic acid and/or adipic acid, and optionally water is provided.

3,560,615

COMPOSITIONS OF THIEPIN AND OXEPIN DERIVATIVES

Walter Schindler, Riehen, and Erich Schmid, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y., a corporation of New York

No Drawing. Continuation-in-part of application Ser. No. 719,804, Dec. 14, 1967, which is a division of application Ser. No. 571,174, Aug. 9, 1966, now Patent No. 3,359,271, which in turn is a continuation-in-part of application Ser. No. 544,684, Apr. 25, 1966. This application Apr. 21, 1969, Ser. No. 818,120

Claims priority, application Switzerland, Apr. 29, 1965, 5,941; Dec. 1, 1965, 16,575; Feb. 11, 1966, 1,973

Int. Cl. A61u *27/00*

U.S. Cl. 424—244 30 Claims

Compositions of dibenzo[b,f]thiepin-10(11H)-ones or dibenz[b,f]oxepin-10(11H)-ones having a piperazinyl group in the 11-position or the pharmaceutically acceptable acid addition salts thereof and methods of producing a depressant action on the central nervous system comprising administration of these compounds. An illustrative compound is 2-chloro-11-(4-methyl-1-piperazinyl)-dibenz[b,f]thiepin-10(11H)-one.

3,560,616

PROCESS OF PROTECTING VEGETATION FROM FUNGI USING QUINOXALINE FOLIAR FUNGICIDES

Richard R. Shaffer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Filed June 17, 1968, Ser. No. 737,294

Int. Cl. A01n *9/22*

U.S. Cl. 424—250 12 Claims

A process has been developed for the protection of vegetation from fungi. This process involves the application of a 2,3-bis(haloalkyl)quinoxaline to the locus of vegetation in amounts to protect the vegetation from the fungi.

3,560,617

PHARMACEUTICAL COMPOSITION CONTAINING 3-BUTYLAMINO - 4 - CHLORO-5-SULPHAMYL-BENZOIC ACIDS AND SALTS THEREOF FOR THE TREATMENT OF OEDEMATOUS CONDITIONS AND HYPERTENSION

Peter Werner Feit, Gentofte, and Herta Bruun, Esrom, near Graested, Denmark, assignors to Lovens Kemiske Fabrik Produktionsaktiesselskab, Ballerup, Denmark

No Drawing. Filed June 4, 1968, Ser. No. 734,213

Claims priority, application Great Britain, June 5, 1967, 25,937/67

Int. Cl. A61k *27/00*

U.S. Cl. 424—250 15 Claims

The invention relates to diuretic and saluretic preparations in dosage unit form, containing the hitherto unknown 3-butylamino-4-chloro-5-sulphamyl-benzoic acid or a salt thereof with a pharmaceutically acceptable base as the active component, if desired together with a hypotensor, the dose of the diuretic being between 10 and 150 mg., calculated as the free acid.

3,560,618

TRIHALOPYRAZINE COMPOSITION AND USE FOR NEMATODE CONTROL

Frances C. O'Melia, Pleasant Hill, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed June 21, 1968, Ser. No. 738,835

Int. Cl. A01n *7/00, 9/22*

U.S. Cl. 424—250 4 Claims

Soil-inhabiting nematodes are controlled by treatment with a nematocidal amount of trichloropyrazine or tribromopyrazine.

3,560,619

AMINOQUINAZOLINES AND QUINAZOLONES IN TREATMENT OF COCCIDIOSIS

Edward F. Harrison and Aubrey A. Larsen, Evansville, Ind., assignors to Mead Johnson & Company, a corporation of Delaware

No Drawing. Filed Jan. 3, 1967, Ser. No. 606,552

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 10 Claims

Administration to poultry of 6-halo-4-aminoquinazolines and 6-halo-4-quinazolones and their 2-methoxy analogs to combat *Eimeria tenella* infections.

3,560,620

INDUCTION OF FIBRINOLYSIS

Joseph M. Schor, Locust Valley, and Nathan Weiner, Rego Park, N.Y., assignors to Endo Laboratories Inc.

No Drawing. Filed Aug. 9, 1966, Ser. No. 571,195

Int. Cl. A61k *27/00*

U.S. Cl. 424—258 16 Claims

Method for inducing fibrinolysis in mammals, and pharmaceutical compositions useful therefor, by the action of specified alkylenebis [1,2,3,4-tetrahydroisoquinoline] compounds or pharmaceutically acceptable acid addition salts thereof.

3,560,621

PHARMACEUTICAL METHOD OF USING 4-PYRIDYLBICYCLO[2.2.2]OCTANE - 1 - AMINES AND FORMULATIONS OF THE SAME

Walter A. Gregory and James C. Kauer, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 749,298, Aug. 1, 1968, which is a continuation-in-part of application Ser. No. 714,062, Mar. 18, 1968, which is a continuation-in-part of application Ser. No. 689,249, Dec. 11, 1967, which in turn is a continuation-in-part of application Ser. No. 467,705, June 28, 1965, now Patent No. 3,367,941. This application Dec. 8, 1969, Ser. No. 883,284

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 25 Claims

This invention relates to methods of using 4-pyridylbicyclo [2.2.2]octane-1-amines and derivatives thereof as antidepressant agents.

This invention further relates to pharmaceutical compositions containing as the active ingredient an antidepressant effective amount of the 4-pyridylbicyclo[2.2.2.]-octane-1-amine.

3,560,622

TRIFLUOROMETHYL OXAZEPINES, THIAZEPINES AND DIAZEPINES AS ANTI-INFLAMMATORY AGENTS

Francis Joseph McEvoy, Pearl River, N.Y., and George Rodger Allen, Jr., Old Tappan, N.J., assignors to American Cyanamid Company, Stamford, Conn., a corporation of Maine

No Drawing. Filed Oct. 13, 1967, Ser. No. 675,044

Int. Cl. A61k *27/00*

U.S. Cl. 424—267 9 Claims

The preparation of 11-substituted 2-trifluoromethoxydibenz[b,f][1,4] oxazepines; 11 - substituted 2 - trifluoromethoxy-dibenz[b,f][1,4]thiazepines and 11-substituted 2-trifluoromethoxy dibenz [b,f][1,4] diazepines, by ring closure of suitable intermediates, is described. The novel compounds are useful as anti-depressants, anti-inflammatory and anti-pyretic agents.

3,560,623

GRISEOFULVIN COMPOSITION

Herbert J. Florestano, Indianapolis, Ind., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 517,988, Jan. 3, 1966. This application Apr. 10, 1969, Ser. No. 815,204

Int. Cl. A61k *27/00*

U.S. Cl. 424—285 1 Claim

Compositions containing griseofulvin and a substantially anhydrous vehicle, the vehicle comprising at least 50 percent of 12 to 18 carbon atoms difatty acid esters of polyethylene glycols of from 200 to 600 molecular weight and at least ten percent of a substantially anhydrous modifying substance, are useful in the control of fungal organisms. Typically, the compositions comprise from about 0.05 to about 10 percent griseofulvin and are employed in topical applications to combat fungal organisms on animal skin surfaces.

3,560,624

ANTICOCCIDIAL 2-ALKYLAMINO-4-AMINO BENZOIC ACIDS

Edward F. Rogers, Middletown, and Robert L. Clark, Woodbridge, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation of application Ser. No. 408,662, Nov. 3, 1964. This application Oct. 18, 1968, Ser. No. 768,933

Int. Cl. A61k *27/00*

U.S. Cl. 424—310 3 Claims

Anticoccidial 2-alkylamino-4-amino benzoic acids are prepared by catalytic hydrogenation of 2-loweralkylamino-4-nitro benzoic acids. The active compounds may be employed in the form of lower alkyl esters, alkali metal or alkaline earth metal salts, or nontoxic acid addition salts.

3,560,625

METHOD OF, AND FORMULATIONS FOR, INTRODUCING ALKOXYBENZAMIDES INTO THE SYSTEMIC CIRCULATORY SYSTEM

Christopher Hollet Costello, Summit, N.Y., and Salvatore Joseph De Salva, Somerset, and John Phillip Ryan, New Brunswick, N.J., assignors to Colgate-Palmolive Company, New York, N.Y., a corporation of Delaware

No Drawing. Filed Feb. 20, 1967, Ser. No. 617,058

Int. Cl. A61k *27/00*

U.S. Cl. 424—324 4 Claims

Alkoxybenzamide analgesics are introduced into the systemic circulation system via a contiguous mucous membrane to increase onset of activity, potency, etc.

3,560,626

PROCESS FOR CONTROLLING NEMATODES WITH FLUORINATED ALCOHOLS

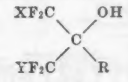
Robert E. A. Dear, Parsippany, and Everett E. Gilbert, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Original application May 16, 1966, Ser. No. 550,113. Divided and this application Oct. 4, 1968, Ser. No. 786,518

Int. Cl. A01n *9/24*

U.S. Cl. 424—343 8 Claims

Use in controlling nematodes of fluorinated alcohols of the formula



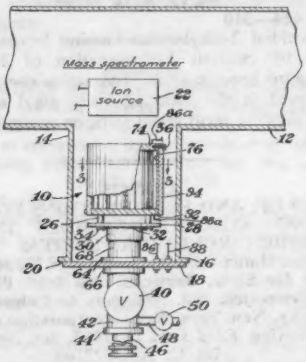
wherein X and Y may be selected from the group consisting of hydrogen, fluorine or chlorine and R is a lower alkyl, alkenyl, alkynyl or chlorine-substituted alkynyl group.

ELECTRICAL

3,560,627
FURNACE ASSEMBLY FOR THERMAL ANALYSIS USE

Horst G. Langer, Wayland, Mass., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

Filed Aug. 7, 1969, Ser. No. 848,232
Int. Cl. H05b *3/00*
U.S. Cl. 13—31 6 Claims

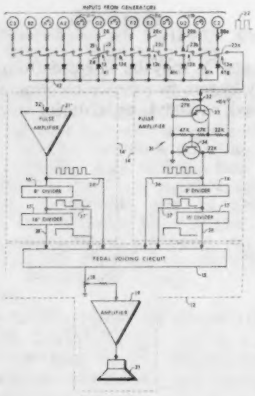


This invention relates to a heating furnace assembly which is adapted to be coupled to and become a part of a mass spectrometer adjacent to the ion source (usually) within the instrument. The furnace is a radiant heating device utilizing glow bar-type heating rods, with or without an adjacent reflective surface and is adapted to be controlled by means of temperature sensing means disposed within a separate thermal analysis cell which is adapted to be disposed within the furnace.

3,560,628
MULTI-CHANNEL KEY SWITCH CIRCUIT

Bradley J. Plunkett, Van Nuys, and John R. Brand, Northridge, Calif., assignors to Warwick Electronics Inc., Chicago, Ill., a corporation of Delaware

Filed June 30, 1967, Ser. No. 650,531
Int. Cl. G10h *1/00, 3/00, 1/02*
U.S. Cl. 84—1.08 6 Claims

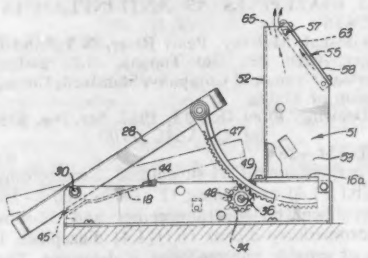


A series of key switches are provided with individual tone sources. From one end of the series, output signal is applied to a first frequency divider circuit, thence to suitable formants and to the output of the musical instrument. From another point, or points, in the series of key switches, a second output is taken and applied through a second frequency divider circuit; thence to the formants and output circuits. If two key switches are closed at the same time, that switch closest to the series end feeding the first channel determines the tone which will pass through the first channel. Selective means are provided to cause the other tone to pass through the second channel. In this way two tones can be simultaneously applied to the output circuit, i.e., loudspeaker, where previously only a single tone could be sounded at any one time (monophonic tone sounding).

3,560,629
MANUALLY-CONTROLLED CIRCUIT

Morris L. Tucci, Van Nuys, Calif., assignor to Warwick Electronics Inc., Chicago, Ill., a corporation of Delaware

Filed Apr. 28, 1965, Ser. No. 451,446
Int. Cl. G05g *1/14*; G05h *1/02*
U.S. Cl. 84—1.27 4 Claims

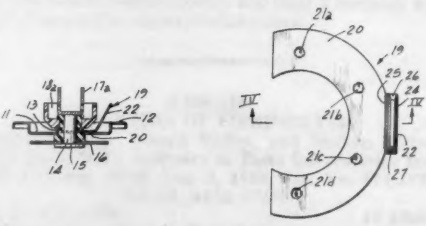


An electronic chassis is provided at its forward edge with a pivoted foot pedal overlying the chassis. The pedal is journaled between projecting sidewalls of the chassis, and through linkages, actuates a control mounted to the chassis. At the rear of the chassis is an upright housing in which relatively large heat-generating components cause a rising column of air which, through venturi action, creates a draft in a portion of the assembly located above the heat-generating components, the latter draft serving to cool other components mounted in the upper portion of the chassis.

3,560,630
ELECTRICAL COMPONENT GROUNDING TERMINAL ASSEMBLY

Chester A. Heather, LaSalle, Ill., assignor to Electrical Utilities Company, LaSalle, Ill., a corporation of Illinois

Filed Aug. 8, 1969, Ser. No. 848,558
Int. Cl. H01g *1/14*
U.S. Cl. 174—51 4 Claims



A terminal assembly for an electrical component of the type wherein the component is enclosed within a conductive housing through which electrical connections to the com-

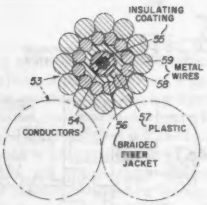
ponent are made employs a grounding terminal electrically and mechanically connected to the housing adjacent the circuit terminals of the component. The grounding terminal is an integral portion of the terminal assembly and is configured to be secured to the housing in close proximity to the circuit terminals, and is provided with mechanical rigidity and electrical conductivity by way of an arcuate portion which is spotwelded to the housing. The terminal also includes a connecting portion which is adapted to receive a soldered connection or a quick-connect lead connector.

3,560,631

MULTICONDUCTOR ARMORED TOWING ROPE

Lee A. Rhoades, and Manley T. Mallard, Culpeper, Va., assignors to The Rochester Corporation, Culpeper, Va., a corporation of Virginia

Original application Mar. 7, 1967, Ser. No. 621,337, now Patent No. 3,482,034. Divided and this application Jan. 21, 1969, Ser. No. 822,334
Int. Cl. H01b 7/18
U.S. Cl. 174—113 **7 Claims**



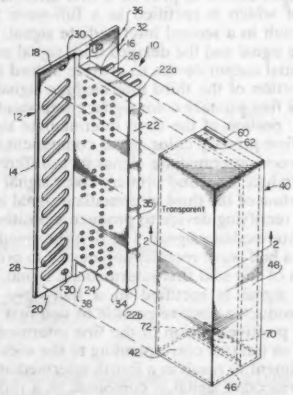
A fishing trawl net includes electrical shocking cables and other electrical instrumentation. The net is towed by a high tensile strength cable which includes an electrically conductive core.

3,560,632

COVER MEANS FOR A TELEPHONE TERMINAL BLOCK

Lowell Wallace, Tateville, Ky. 42558

Filed Aug. 28, 1969, Ser. No. 853,827
Int. Cl. H01r 9/02
U.S. Cl. 174—138 **8 Claims**



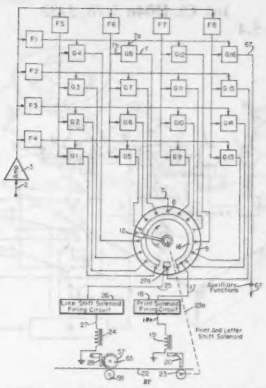
An enclosure formed of a transparent material for removable mounting on a conventional telephone terminal block and completely shielding the terminals at one side of the terminal mounting plate in spaced relationship relative thereto to protect the terminals against inadvertent physical or mechanical contact.

3,560,633

DECODER AND PRINTOUT UNIT FOR DATA TRANSMISSION SYSTEM

Jack Shapiro, 5 Lynn Drive, Englewood Cliffs, N.J. 07632

Filed Jan. 14, 1969, Ser. No. 790,962
Int. Cl. H04l 17/16
U.S. Cl. 178—4 **10 Claims**



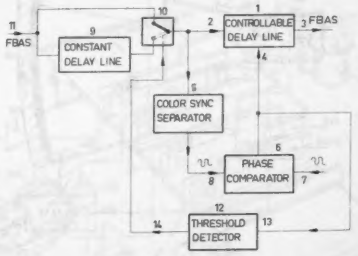
A device to accept multitone data signals from a data transmission source, such as a telephone line, decode said signals by means of filters combined with a matrix of gate circuits to produce a decoded output signal for the various combinations of the tones employed, said gate output signals being fed to a synchronizing commutator to fire printing solenoid circuits at the instant when the corresponding data character is in proper position on a printing wheel. Certain of the gate signals denote data characters and others control functions of line spacing, end of message, etc.

3,560,634

CIRCUIT ARRANGEMENT FOR TIME ERROR BALANCING

Wolfgang Dillenburger, and Gerhard Krause, Darmstadt, Germany, assignors to Fernseh G.m.b.H., Darmstadt, Germany, a corporation of Germany

Filed Feb. 12, 1968, Ser. No. 704,603
Claims priority, application Germany, Feb. 16, 1967, F51539
Int. Cl. H04n 9/02
U.S. Cl. 178—5.2 **4 Claims**

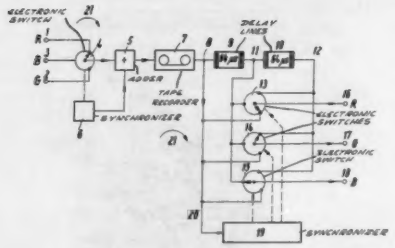


In addition to the conventional adjustably controllable delay line in the path of a color television signal, a delay line of fixed or constant transit time is herein included in the path of the color signal. The conventional adjustable delay line is controlled ordinarily by a function of the phase difference or error between the color sync signal and a fixed frequency signal reference. Here, the constant time delay line is given a transit time constant equal to one-half a period of the color carrier, which is constant, and serves as the reference frequency. That constant delay line is cut out of, or back into, circuit according to the amplitude of the error signal, whose amplitude is made a linear function of phase angle here.

3,560,635
SYSTEM FOR TRANSMITTING A NARROW-BAND LINE AND FOR SIMULTANEOUS REPRODUCTION OF SUCH SIGNAL

Walter Bruch, Hannover, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm, Germany

Filed Mar. 28, 1967, Ser. No. 626,481
Claims priority, application Germany, Apr. 9, 1966, Oct. 14, 1966, T30887;T32270
Int. Cl. H04n 5/78, 5/02
U.S. Cl. 178—5.4 5 Claims

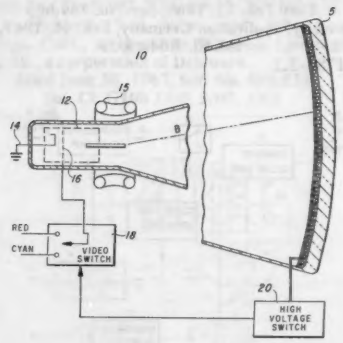


In a recording or transmitting system for color television signals where three signals R,G,B representing three different color components are recorded or transmitted one after the other line by line, the three color signals are made available simultaneously in each line by means of two delaying devices each with the delay time of the length of one line.

3,560,636
COLOR DISPLAY SYSTEM

Carl A. Barlow, Jr., Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex., a corporation of Delaware

Filed Apr. 6, 1967, Ser. No. 628,962
Int. Cl. H04n 9/22; H01j 29/18
U.S. Cl. 178—5.4 3 Claims

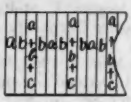


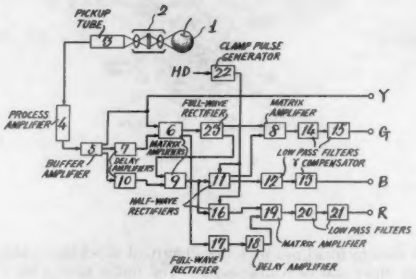
Color display systems are described for producing polychromatic color images from two different color records corresponding to two substantially different respective hues, one color record effecting the production of an image portion in relatively long wavelength or red light, while the other image portion is produced in white light having a color temperature between about 2800*L* to 3600*L* K. Phosphor materials which produce white light of this desired spectral composition and quality are disclosed as having a relative luminosity ratio of $I_R:I_G:I_B \simeq 0.4/0.56/0.04$.

3,560,637
METHOD AND APPARATUS FOR SEPARATING MULTICOLOR VIDEO SIGNALS INTO PRIMARY COLOR SIGNAL COMPONENTS BY POLARITY SEPARATION TECHNIQUES

Saneyuki Takeuchi, and Hideo Watanabe, Tokyo, Japan, assignors to Fuji Telecasting Company, Ltd., Tokyo, Japan, a corporation of Japan

Filed Jan. 23, 1968, Ser. No. 699,928
Claims priority, application Japan, Feb. 9, 1967, 42/7916
Int. Cl. H04n 9/06
U.S. Cl. 178—5.4 15 Claims





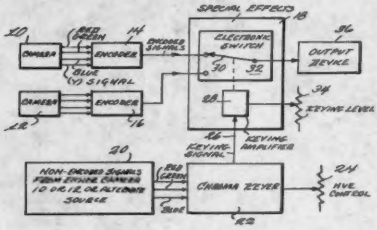
Method and apparatus for separating a multicolor video signal into primary signal color components utilizing a finely divided, striped optical filter forming a video signal image on a signal image pickup tube provided with constant width primary color filaments. The output from the image pickup tube is divided into three signals. The second signal is delayed twice the time interval corresponding to the width of a primary color filament. The third signal is delayed by a time interval corresponding to the width of a primary color filament. The first and the delayed second signal is combined in a differential output device to provide a first intermediate signal, a portion of which is rectified in a full-wave rectification device to result in a second intermediate signal. The second intermediate signal and the delayed third signal are combined in a differential output device to provide a third intermediate signal. A portion of the third intermediate signal is rectified to produce a first primary color signal component comprising the negative portion of the third intermediate signal. A portion of the first primary color signal component is combined with the second intermediate signal in a differential output device to produce a second primary color signal component. Another portion of the third intermediate signal is rectified in a half-wave rectifying device to produce a positive portion of said third intermediate signal. The first intermediate signal is rectified in a half-wave rectification device to produce a positive portion of the said first intermediate signal. The first intermediate signal is rectified in a half-wave rectification device to produce a positive portion of said first intermediate signal. The positive portion of the first intermediate signal is delayed by an interval corresponding to the width of a primary color filament to result in a fourth intermediate signal. The fourth intermediate signal is combined in a differential output device with the positive portion of said third intermediate signal to produce a third primary signal component. Accordingly, the full-wave and half-wave rectification techniques applied to the intermediate signals, and the subsequent combination in differential output devices of the delayed signals comprise polarity separation techniques for separating a multicolor video signal into primary color signal components.

3,560,638

CHROMA DEYING SYSTEM UTILIZING REMOTE CONTROLLED CHROMA KEYER

Ole Skrydstrup, Pierrefonds, Quebec, and John D. Ross, Dollard des Ormeaux, Quebec, Canada, assignors to Central Dynamics, Ltd., Montreal, Quebec, Canada, a body corporate

Filed Apr. 22, 1968, Ser. No. 722,841
Int. Cl. H04n 9/04
U.S. Cl. 178—5.4 10 Claims



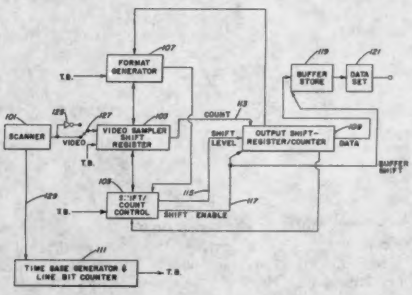
A chroma-keying system is disclosed which utilizes a keying signal source which is responsive to a particular color of interest from a video source. The keying signal source is continuously adjustable so that any color may be selected from the video source. Whenever the selected color exceeds in amplitude a threshold level established at a keying amplifier, the amplifier causes an appropriate output device to be switched from one television camera to another to thereby create a special effects signal at the device. When the keying signal decreases in amplitude below the threshold level of the keying amplifier, the output device is switched back to the original camera. With a single control remotely located from the chroma-keying system (at the operator console, for example), the operator can continually adjust the color of interest from the video source and thus, the special effects signal at the output device can be continuously adjusted, if so desired.

3,560,639

CASCADE RUN LENGTH ENCODING TECHNIQUE

James D. Centanni, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y., a corporation of New York

Filed Oct. 3, 1966, Ser. No. 583,901
Int. Cl. H04n 7/12
U.S. Cl. 178—6 21 Claims



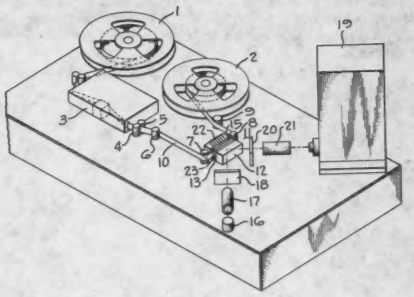
A selective encoding technique utilizing a typical distribution of information on a document to statistically encode the detected lengths of redundant background or data information into code word representations. A more frequently occurring run length will be encoded with a shorter code word than that of a lesser occurring run length. A format generator, in response to the changing run lengths presented to it, generates the necessary format levels to allow for the different code word lengths which represent the different detected run lengths.

3,560,640

MAGNETIC RECORDING SYSTEM HAVING GRAY SCALE REPRODUCTION

Robert K. Waring, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Filed Jan. 10, 1968, Ser. No. 696,754
Int. Cl. H04n 3/10; G11b 11/10; G02f 1/18
U.S. Cl. 178—6.6 15 Claims



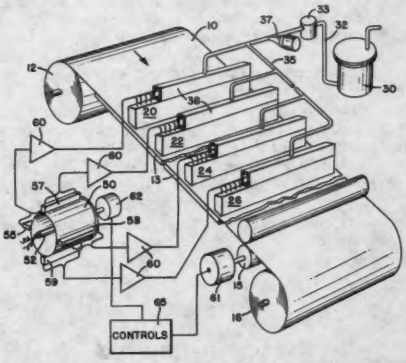
A magneto-optic reproducing system is disclosed in which primary magnetic images recorded on a recording medium are reproduced with a gray scale corresponding with the tone of the original. In such a system, a periodic magnetic field is applied to a receptor member at the same time that the local surface fields of the magnetic record are applied to the receptor member. The periodic magnetic field may be either spatially periodic or a time varying periodic field. An intermediate magnetic member is disposed between the recording medium and the receptor member to apply a magnetic field to the receptor member. This assists in providing good gray scale reproduction.

3,560,641

IMAGE CONSTRUCTION SYSTEM USING MULTIPLE ARRAYS OF DROP GENERATORS

Richard P. Taylor; Russell H. VanBrimer, and Fred E. Culp, Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio, a corporation of Ohio

Filed Oct. 18, 1968, Ser. No. 768,790
Int. Cl. H04n 1/22
U.S. Cl. 178—6.6 9 Claims



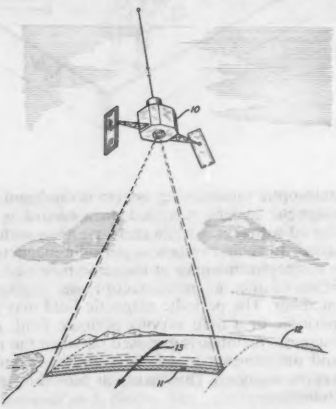
Arrays of laterally spaced orifices, all communicating with a liquid pressure supply, all subjected to vibration at the same frequency to separate the liquid jets into streams of individual drops, provide a system for locating all of the drops with a predetermined space-time correlation, by depositing the drops on a receiving element which has relative movement with respect to the arrays at a speed correlated to the

drop generation rate, or by irradiating the drops in space at a predetermined time to make them visible. Uses include printing multiple copies from a master, high-speed printout from a computer or memory, and creation of variable three dimensional visible shapes for study.

3,560,642
TELEVISION SATELLITE SYSTEM

Irvin H. Schroader, Rockville; Theodore Wyatt, Union Bridge; George B. Bush, Clarksville, and Charles J. Swet, Mount Airy, Md. assignors, by mesne assignments, to the United States of America as represented by the Secretary of the Navy

Filed Oct. 13, 1967, Ser. No. 675,255
Int. Cl. H04h *5/72*
U.S. Cl. 178—6.8 **9 Claims**



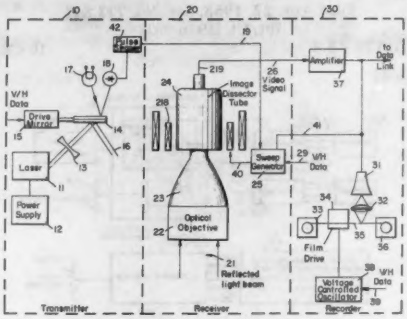
The present invention generally relates to a long life television system carried aboard a passively stabilized satellite for continuously providing linearized, high resolution coverage of the earth or other body about which the satellite orbits. More specifically, the proposed system of the present invention operates on a line-scan principle; i.e., the satellite carries a lens system whose field of view is a narrow, elongated swath on the earth's surface which advances due to the satellite orbital motion. A fiber optic assembly receives the light image from the lens system and transfers it, as a substantially square raster, to the photosensitive faceplate of an image dissector camera tube, for example, where the image is then electronically scanned at a rate dependent upon the time that it takes for the satellite's field of view (image swath) to advance a distance corresponding to the width of one resolution element of the image dissector. The resulting output video information from the image dissector camera tube is then encoded, along with satellite altitude information, onto a transmitted carrier frequency. At the ground receiving station, the video information is decoded and is then transformed, by suitable electro-optical transducer means, into a visual display on a drum recorder or a cathode ray oscilloscope, for example. The proposed television system of the present invention also includes means for compensating or rectifying the video display to account for curvature of the earth.

3,560,643
LINE SCANNING SYSTEM

Charles E. Love, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif., a corporation of Delaware

Filed Nov. 2, 1967, Ser. No. 682,723
Int. Cl. H04n *3/08*
U.S. Cl. 178—6.8 **10 Claims**

A ground mapping system for obtaining images of terrain from a moving aircraft including a transmitter equipped to scan a terrain target area with a laser beam, a receiver adapted to electronically scan a focal surface on which reflected light images are formed, and a recorder for providing a record of the images formed on said focal surface

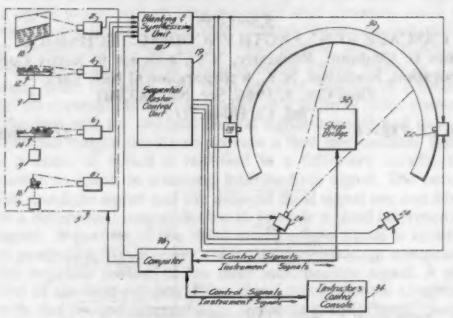


thereby producing a visual representation of the observed terrain.

3,560,644
MULTIPLE PROJECTION TELEVISION SYSTEM

Edward A. Petrocelli, and Robert G. Palmer, Orlando, Fla., assignors to the United States of America as represented by the Secretary of the Navy

Filed Feb. 29, 1968, Ser. No. 709,385
Int. Cl. H04n *3/00, 5/74*
U.S. Cl. 178—6.8 **2 Claims**



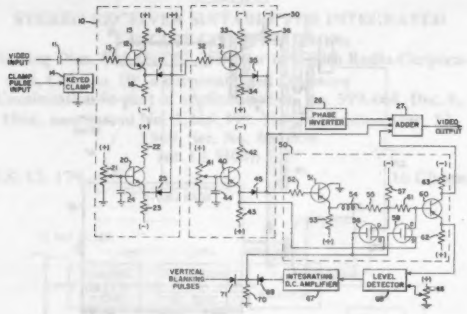
In prior art simulators used in training devices, a plurality of TV cameras survey a seascape and a plurality of ship models respectively to furnish video information which is combined into a picture of ships maneuvering on a seascape background and displayed on a CR tube monitor or a screen. The invention enhances the realism of such simulators by using a plurality of TV projectors each projecting a picture on a respective sector of a circular screen. Circuitry is provided for synchronizing the projectors with the cameras so that a ship may be caused to move across a screen which may completely surround a control station occupied by a trainee to give him the impression of being at sea. The circuitry enables any projector to project video information from any or all cameras, in contradistinction to prior art systems wherein each projector receives information from an associated camera only.

3,560,645

TELEVISION CAMERA GAIN CONTROL CIRCUIT WITH COMPRESSED WIDE CONTRAST RANGE RESPONSE

Howard B. Wallace, Jr., Syracuse, N.Y., assignor to General Electric Company, a corporation of New York

Filed Mar. 27, 1970, Ser. No. 23,387
Int. Cl. H04n 5/20
U.S. Cl. 178—7.1 14 Claims



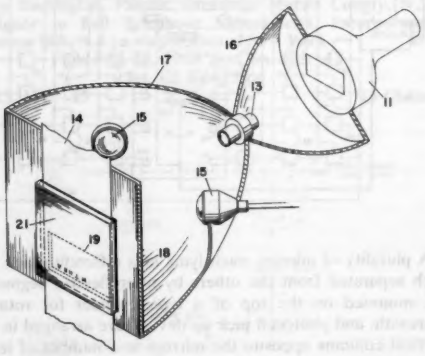
Loss of detail in the bright portion of an image of a scene having a bright portion and a dark portion, as viewed by a vidicon pickup tube, is avoided by compressing the video signal in excess of a predetermined threshold amplitude. The signal is black-clipped at the predetermined threshold amplitude, and the entire portion of signal above this amplitude is compressed within a predetermined amplitude range by controlled attenuation circuitry whenever the signal exceeds this range. The portion of signal thus compressed is added to the portion of signal extant below the predetermined threshold amplitude to produce an amplitude-limited output signal which retains detail in the dark portion of the image while preserving most of the detail in the bright portion.

3,560,646

READING DEVICE EMPLOYING AN ENCLOSURE FOR A LIGHT SOURCE AND THE DOCUMENT TO BE READ AND HAVING A HIGHLY LIGHT REFLECTIVE INTERNAL SURFACE

George L. Buc, Fairfax, Va., assignor to Farrington Electronics Incorporated, Springfield, Va., a corporation of Massachusetts

Continuation of application Ser. No. 501,230, Oct. 22, 1965, now abandoned. This application Feb. 20, 1969, Ser. No. 811,272
Int. Cl. H04n 1/10
U.S. Cl. 178—7.1 7 Claims



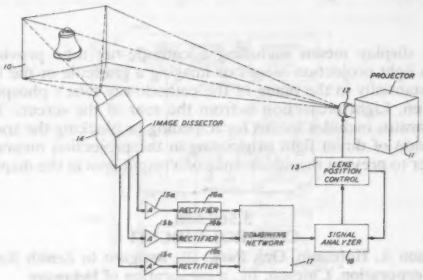
A reading device is disclosed wherein the document to be read is passed through one side of an enclosure, the side walls of which are provided with a highly light reflective surface. At the opposite side of the enclosure is provided a scanning light source such as produced by a cathode ray tube. Disposed within the disclosure is at least one light sensitive device such as a phototube for receiving the light which is reflected from the document. Because of the light reflective surface, the efficiency of the scanning operation is significantly increased.

3,560,647

AUTOMATIC FOCUSING SYSTEM

Leon D. Harmon, Watchung, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J., a corporation of New York

Filed Feb. 27, 1968, Ser. No. 708,639
Int. Cl. G03b 3/02
U.S. Cl. 178—7.2 8 Claims



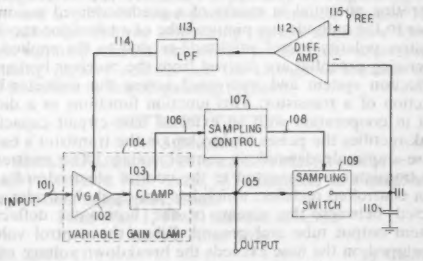
A projected image may be brought into focus automatically by sensing a reflected image, e.g., with an electronic camera, and responsively adjusting the projector focus until an examination of the image denotes the greatest signal content. However, colorblind image dissectors fail to distinguish between image structures possessed of equal brightness characteristics but of different hues. By using separate spectrally sensitive channels, information about color as well as brightness transitions is made available for analysis. As a result, finer resolution sensing and optimum dissection is achieved.

3,560,648

SAMPLED DATA AUTOMATIC GAIN CONTROL CIRCUIT

Sotirios C. Kitsopoulos, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed Aug. 29, 1968, Ser. No. 756,188
Int. Cl. H04n 5/56
U.S. Cl. 178—7.3 11 Claims



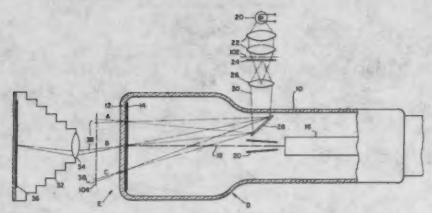
Precise automatic gain control is achieved by sampling the amplitude of individual ones of the synchronizing pulses of a received composite video signal. Spurious gain changes are minimized by deriving drive signals for initiating sampling of the synchronizing pulse amplitude from each of the individual synchronizing pulses.

3,560,649

CATHODE RAY TUBE WITH PROJECTION MEANS

Robert H. Anderson, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg., a corporation of Oregon

Filed May 23, 1967, Ser. No. 640,526
Int. Cl. H04n *5/64, 5/72*
U.S. Cl. 178—7.5 12 Claims



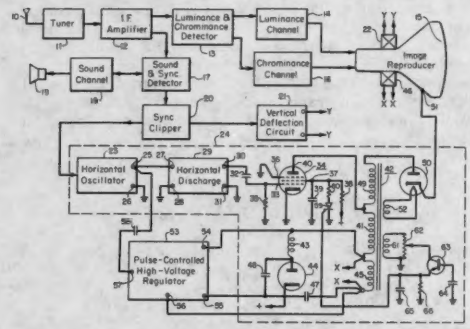
A display means including a cathode-ray tube provided with light projection means or imaging a graticule or the like substantially in the plane of the cathode-ray tube's phosphor screen. Light projection is from the rear of the screen. The apparatus includes means for impeding or blocking the transmission of direct light originating in the projection means in order to prevent the occurrence of a bright spot in the display.

3,560,650

CONTROL CIRCUIT

Judson A. Hofmann, Oak Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill., a corporation of Delaware

Filed Dec. 20, 1968, Ser. No. 785,683
Int. Cl. H04n *3/18*
U.S. Cl. 178—7.5 9 Claims



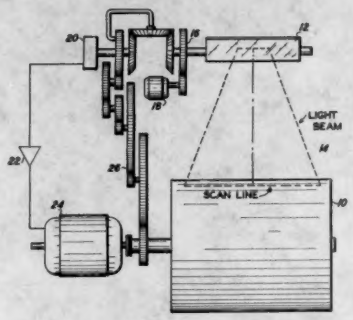
A control circuit for preventing the application of accelerating potential in excess of a predetermined maximum value to the cathode-ray picture tube of a television receiver. Positive polarity pulses amplitude-related to the applied accelerating potential are derived from the receiver horizontal deflection system and impressed across the collector-base junction of a transistor. This junction functions as a diode, and in cooperation with an external base-circuit capacitor-peak-rectifies the pulses to develop on the transistor's base a pulse-amplitude dependent control voltage. The emitter of the transistor is connected to the control electrode of a silicon controlled rectifier, which has principal electrodes connected between the screen of the horizontal deflection system output tube and ground. When the control voltage developed on the base exceeds the breakdown voltage of the transistor's emitter-base junction, the control voltage is impressed on the control electrode of the silicon controlled rectifier and causes that device to conduct, substantially reducing the screen current applied to the output tube. This reduces the energy available for powering the receiver's sweep-excited high voltage power supply, and hence prevents further generation of accelerating potential in excess of the predetermined maximum value.

3,560,651

MECHANICAL FEEDBACK FOR FACSIMILE SCANNING SYSTEM

Charles T. Roth, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y., a corporation of New York

Filed Nov. 8, 1967, Ser. No. 681,542
Int. Cl. H04n *1/36, 1/04*
U.S. Cl. 178—7.6 8 Claims



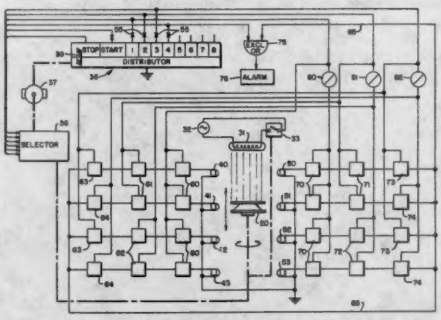
A facsimile scanning system utilizing a feedback system to drive the scan drum combined with a stepping motor to index between scan lines. In conjunction with an adaptive bandwidth compression technique, a mechanical feedback system is utilized for drum and reciprocal mirror synchronization. Where the stepping rate is a function of the document complexity, a stepping motor is provided for stepping the drum for lines of variable information density detected on the document. The scanning mirror and the drum are geared together through a gear train which tends to rotate the scan line on the drum surface without relative motion between the optical scan line and the actual image on the drum surface.

3,560,652

TYPE CYLINDER POSITION MONITORING CIRCUIT

George Arthur Kim, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill., a corporation of Delaware

Filed Apr. 11, 1968, Ser. No. 720,545
Int. Cl. H04l *17/24*
U.S. Cl. 178—34 12 Claims



A plurality of mirrors, each lying in a different plane and each separated from the others by nonreflective segments, are mounted on the top of a type cylinder for rotation therewith, and photocell pick up devices are arranged in two vertical columns opposite the mirrors in a number of levels equal to the number of vertical levels to which the type cylinder may be positioned. The permutation signal which causes the positioning of the type cylinder to particular vertical and rotational positions also is decoded to complete a cir-

cuit path to one only of the photocells. When the positioning of the type cylinder is completed, light is flashed onto the mirrors; and if a mirror is opposite the selected photocell, light impinges on the photocell. The output of the selected photocell then is used to indicate whether or not the proper vertical level and column selection has been made.

3,560,653

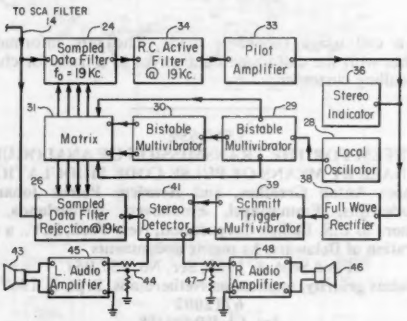
STEREO RECEIVER SUITABLE FOR INTEGRATED CIRCUIT CONSTRUCTION

Fleming Dias, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill., a corporation of Delaware

Continuation-in-part of application Ser. No. 599,468, Dec. 6, 1966, now Patent No. 3,466,399. This application Mar. 12, 1969, Ser. No. 806,636

Int. Cl. H04h *5/00*

U.S. Cl. 179—15 **16 Claims**



A receiver for stereophonic program signals wherein demodulation of a received stereophonic subcarrier signal is accomplished by inductorless demodulation circuitry suitable for integrated circuit construction. A sampled data-type filter, located between the receiver frequency modulation detector and integrated circuit stereo demodulator, extracts the pilot signal from the composite signal with a sufficiently high signal-to-noise ratio to permit derivation of a continuous-wave demodulation signal at the subcarrier frequency within the integrated circuit demodulation stages without the provision of further tuned circuitry therein.

3,560,654

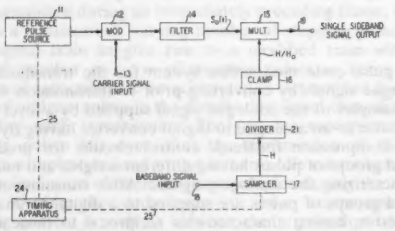
MODULATION AND DEMODULATION APPARATUS USING REFERENCE TIME FUNCTIONS

Sidney Darlington, Passaic Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed Feb. 25, 1969, Ser. No. 802,142

Int. Cl. H04j *3/04*

U.S. Cl. 179—15 **15 Claims**



A single-sideband modulator and demodulator are realized by using reference time functions. The desired modulated or demodulated signals are generated by modulating and filtering a train of pulses of constant amplitude to develop a reference time function which, in turn, is scaled in accordance with sampled values of an applied baseband or modulated signal.

3,560,655

TELEPHONE SERVICE REQUEST SCAN AND DIAL PULSE SCAN DEVICE

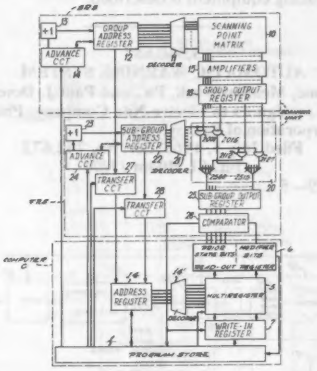
Pierre M. Lucas, 20, rue Tariel, Issy-les-Moulineaux; Jean F. Duquesne, 120, rue de Javel, Paris, and Charles E. Abraham, 114 Elysees II, La Celle Saint Cloud, France

Filed Oct. 28, 1968, Ser. No. 771,108

Claims priority, application France, Oct. 27, 1967, 126,266

Int. Cl. H04m *3/22*; **H04q** *3/54*

U.S. Cl. 179—18 **3 Claims**



Scanning circuit arrangement for scanning test terminals respectively connected to subscriber's lines and disposed along rows and columns in a matrix, the purpose of which is to detect by means of a unique scanning the service requests and the dial pulses. The terminals are scanned in groups defined by a group address and forming group test words, at a first rate, and the groups are divided into subgroups defined by a subgroup address and forming subgroup test words, at a second rate multiple of the first rate. The subgroup test words are stored in the registers of a test multiregister and the actual and previous subgroup test words are compared in a comparator which detects the rank or address of the bits in the subgroup test word which have undergone a change. The address of the test terminal including the group address, the subgroup address and the bit address are applied to a second multiregister which comprises a plurality of originating registers and a table of correspondence between the test terminal addresses and the originating register addresses. From the test terminal address, the second multiregister derives the originating register address and the change of the test terminal is written in this originating register.

3,560,656

BINAURAL PHASE DIFFERENTIAL SYSTEM

Roswell W. Gilbert, New York, N.Y., assignor to Dictaphone Corporation, Bridgeport, Conn.

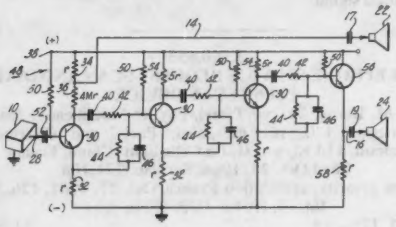
Filed May 1, 1967, Ser. No. 634,981

Int. Cl. H04r *5/00*

U.S. Cl. 179—1 **11 Claims**

Monaural electrical signals are divided into two separate components flowing in two separate channels, and the phase of the signal in one channel is shifted by means of a Wien bridge which has been offset (unbalanced) so as to transmit signals at all frequencies of interest substantially without attenuation. The signal in each channel is conducted to a separate loud speaker with the transducers either spatially separated or coupled together to form a headset. The phase

difference between the signal from one speaker and the signal from the other provides depth and reality in the reproduced sound. Use of this system in dictation recording and reproducing equipment is described.



3,560,657

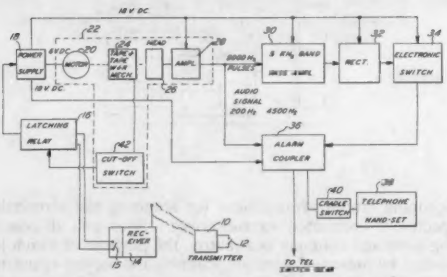
AUTOMATIC WARNING SYSTEM

Paul L. Stone, Meadowbrook, Pa., and Paul J. Dever, Cherry Hill, N.J., assignors to Electro-Nite Company, Philadelphia, Pa., a corporation of Pennsylvania

Filed July 5, 1968, Ser. No. 742,672

Int. Cl. H04m *11/04*

U.S. Cl. 179—5 **1 Claim**



An automatic warning system responds to a warning signal energized by an outside agency by closing a switch which permits a power supply to energize the motor on a tape deck, the tape deck generates a plurality of single frequency pulses which are rectified and used to energize an electronic switch that provides data to a coupling mechanism and dials a remote telephone. After the telephone is dialed, the tape deck broadcasts a voice signal and then a further series of single frequency pulses that resets the system and dials a second number or the same number. The switch is then opened and the system turned off.

3,560,658

TRUNK USAGE RECORDING AND CALL CHARGING EQUIPMENT

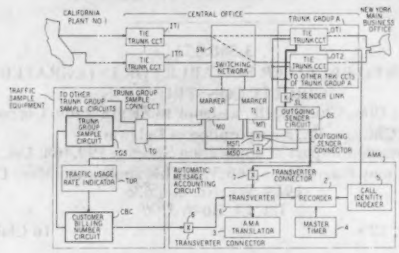
Peter E. Molloy, deceased, late of Hazlet, N.J., by Elizabeth A. Molloy, executrix, Hazlet, N.J.; Edward C. Pienkowski, Westerville; James B. Shepard, Columbus, Ohio, and Richard M. Swanson, Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed Oct. 18, 1968, Ser. No. 768,938

Int. Cl. H04m *15/18*

U.S. Cl. 179—8.6 **23 Claims**

Equipment is disclosed in a communication switching office for counting the number of trunk circuit usages in a trunk group and after a predetermined number are counted for causing a call data record to be made. Certain trunk circuits of the group are equipped to access call recording circuitry and are controlled by a trunk group sample circuit during the establishment of calls thereover to make the data records which pertain to calls made of the entire group. Circuitry is also provided for indicating the traffic usage rate, or average trunk circuit holding time, and for recording it each time a call usage record is made. The rate information together with the call usage data serves as a basis for charging a calling customer.



3,560,659

SYSTEM FOR THE TRANSMISSION OF ANALOGUE SIGNALS BY MEANS OF PULSE CODE MODULATION

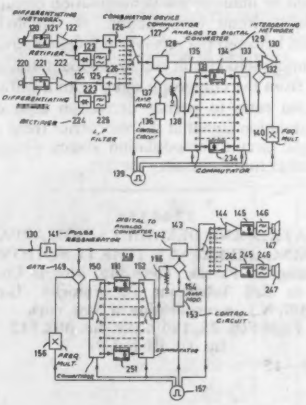
Johannes Anton Greefkes, and Henricus Petrus Johannes Boudewijns, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y., a corporation of Delaware. by mesne assignments

Filed Sept. 3, 1968, Ser. No. 757,051

Claims priority, application Netherlands, Sept. 2, 1967, 6712082

Int. Cl. H04j *3/18*

U.S. Cl. 179—15 **17 Claims**



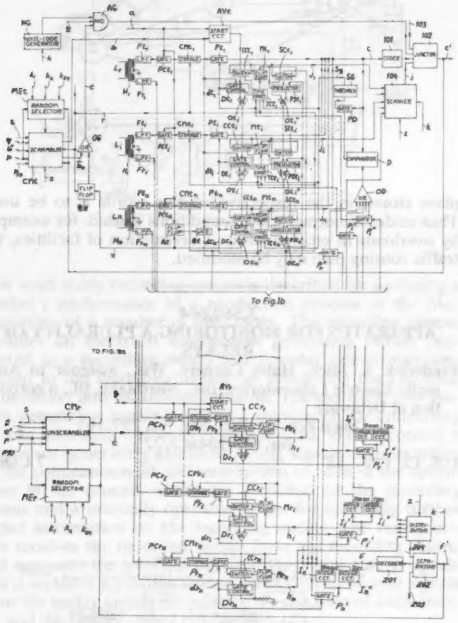
A pulse code modulation system for the transmission of analogue signals by converting prior to transmission successive samples of the analogue signal supplied by a level signal generator to an analogue to digital converter having dynamic high compression feedback control circuits for producing coded groups of pulses having different weights and numbers characterizing the analogue signals. After transmission, the coded groups of pulses are supplied to a digital to analogue converter, having characteristics reciprocal to those of the transmitter's analogue to digital converter, and a dynamic expansion control circuit, having reciprocal characteristics of the transmitter's compression circuits to produce exact reproductions of the original analogue signals.

3,560,660

TIME-ALLOCATION COMMUNICATION SYSTEM WITH SCRAMBLING NETWORK

Isidoro Poretti, Castiglione, and Gianmario Costa, Cornaredo, Italy, assignors to Societa Italiana Telecomunicazioni Siemens s.p.a., Milan, Italy, a corporation of Italy

Filed Dec. 16, 1968, Ser. No. 783,860
Claims priority, application Italy, Dec. 14, 1967, 23,856-A/67
Int. Cl. H04k 1/00
U.S. Cl. 179—15 10 Claims



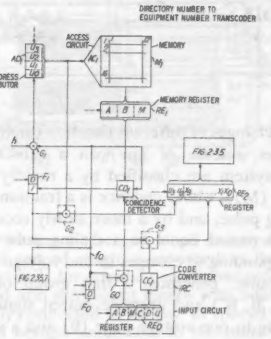
Telephone communication system wherein two groups of subscribers, associated with opposite terminals of a two-way trunk line, are selectively connectable to that trunk line for transmission or reception under the control of a train of stepping pulses generated during a signal-transmission period of an operating cycle or frame, the number m'' of stepping pulses in that train (and therefore the number of subscriber lines so connectable in any one frame) being half the total number of subscribers in each group. A distribution signal, sent out at the beginning of a frame during an allocation period, consists of a succession of address pulses identifying the calling subscribers whose message samples are transmitted in coded form during the following transmission period. The stepping pulses are fed to a scrambler which, under the control of a random selector responsive to the combination of code pulses in the first several message samples transmitted during an immediately preceding frame, suppresses a continuously varying number of stepping pulses in the original train to give rise to a modified train with a reduced number m w of stepping pulses, w being the number of subscribers to be connected as determined from a count of address pulses in the distribution signal immediately preceding such transmission. The $(m—w)$ supernumerary stepping pulses left over after the transmission of the w message samples are used to test hitherto idle subscribers for possible inclusion of their message samples during the next frame. During the occurrence of these supernumerary stepping pulses, as well as between the termination of the foreshortened pulse train and the end of the transmission period, a noise code generator is connected to the trunk to transmit spurious message signals which at the receiving terminal are weeded out by an unscrambler under the control of another random selector responsive to the same combination of code pulses as the selector at the transmitting terminal.

3,560,661

DIRECTORY NUMBER-EQUIPMENT NUMBER AND EQUIPMENT NUMBER-DIRECTORY NUMBER TRANSLATOR ARRANGEMENT

Stanislas Kobus, Antwerpen, Belgium, and Adelin Eugene Gaston Salle, Paris, France, assignors to International Standard Electric Corporation, New York, N.Y., a corporation of Delaware

Filed Sept. 10, 1968, Ser. No. 758,750
Claims priority, application Netherlands, Sept. 22, 1967, 6713017
Int. Cl. H04q 3/47
U.S. Cl. 179—18 6 Claims



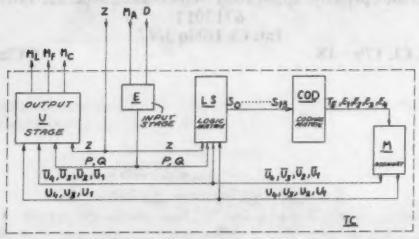
The present invention relates to a two-way translator arrangement for an automatic switching system including n groups of substation lines, each of the n group including a plurality of substation lines, certain ones of the plurality of lines being normal lines having a normal class-of-service and whose directory and equipment numbers are associated by a predetermined systematic relationship and special lines whose directory and equipment numbers are not so associated and/or which have a special class-of-service. The special lines are further divided into first level special lines for which the group number portion of their directory and equipment numbers are associated by a given one-to-one relationship and second level special lines for which the group number portion of their directory and equipment numbers are not so associated. The arrangement includes a detection means addressable by one of the directory and equipment numbers to detect the presence of special lines and produces a control signal in response thereto, a first translation stage including n substages each assigned to the first level special lines of a different one of the n groups and a second translation stage assigned in common to the second level special lines of all the n groups. When the control signal is produced, the one of the n substages associated with that one of the n groups containing the addressed special line is activated to carry out the required translation and the second translator stage detects the failure of the one of the n substages to carry out the required translation because the addressed special line is not one of the first level special lines and to activate the second translator stage to carry out the required translation. In addition, an auxiliary translator stage is coupled to both the first and second translator stages to cooperate therewith in case the addressed line is of a complex class and/or has a transfer of call facility.

3,560,662

TIME-SHARING TELECOMMUNICATION SYSTEM WITH LOGIC CIRCUITRY FOR CLASSIFYING LINE-VOLTAGE CHANGES OF DIFFERENT DURATION

Luigi Casella, and Giorgio De Varda, Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens s.p.a., Milan, Italy

Filed Oct. 30, 1968, Ser. No. 771,770
Claims priority, application Italy, Oct. 30, 1967, 22,151A/67
Int. Cl. H04m 3/22
U.S. Cl. 179—18 7 Claims



Voltage changes of different duration (dialing pulses, interdigit pauses, release of line) on a subscriber line of a telephone system are classified by a rapidly recurring sampling pulse (M_A), whose cadence is a fraction of the duration of a dialing pulse, and by a more slowly recurring test pulse (Z) with a period equal to a dialing pulse cycle. A logic matrix, responding to changes in line voltage detected by the sampling pulse, generates a first group of stable output signals (R, B, B′) and unstable output signals (B_1, B_2, B_1', B_2') relating to one voltage state (**0**) and a second group of stable output signals (H, C, C′) and unstable output signals (H_1, H_2, C_1 C_2, C_1', C_2') relating to an alternate voltage stage (**1**), a sustained voltage change from one state (e.g. **1**) to the other (e.g. **0**) causing a switchover from an assigned stable output signal (e.g. C) of one group by way of associated unstable output signals (e.g. C_1, C_2) to a corresponding stable output signal (e.g. B) of the other group. The occurrence of a test pulse (Z) shifts the output signals within each group in a predetermined sequence from a starting signal (B or C) via a transition signal (B′ or C′) to a permanence signal (R or H), giving rise to either of two classification pulses (M_L, M_F) to indicate line release in the presence of a permanence signal of the first group (R) or an interdigit pause in the presence of a transition signal of the second group (C′). A switchover to a starting signal of the second group (C) gives rise to a further classification pulse (M_C) to indicate a dialing pulse.

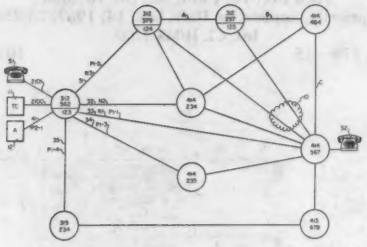
3,560,663

TRAFFIC CONTROL FOR MODIFYING THE ROUTING PLAN IN A NETWORK OF SWITCHING CENTERS

David K. K. Lee, and Don N. Wong, Chicago, Ill., assignors to Automatic Electric Laboratories, Inc., Northlake, Ill., a corporation of Delaware

Filed Jan. 30, 1969, Ser. No. 795,285
Int. Cl. H04q 3/56
U.S. Cl. 179—18 29 Claims

A communications network is disclosed wherein the code translation and routing apparatus at each switching center includes a memory having a number of code words and a number of routing words. Each code word stores a code which usually comprises three or six digits used in an associative search by comparison with the corresponding dialed digits. Each code word or group of code words is followed by one or three routing words, each of which designates one or more trunk groups, which may comprise a primary route and a number of alternate routes. Some of the code words include an automatic traffic control digit which directs which one of three routing words is to be used. The value of the traffic digit for each code or group of codes may be modified by a traffic controller by a call from a special station, to thereby designate which one of three predetermined routing



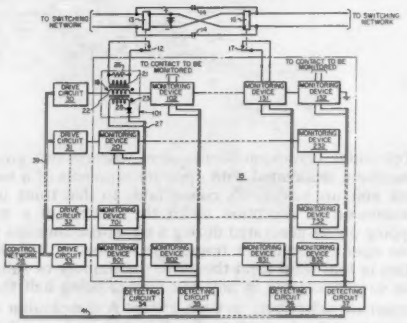
plans stored in the respective routing words is to be used. Thus under abnormal traffic conditions caused, for example, by overloads in emergencies, or destruction of facilities, the traffic routing plan may be modified.

3,560,664

APPARATUS FOR MONITORING A PLURALITY OF RELAYS

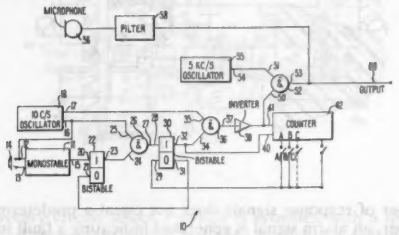
Frederick A. Stich, Hales Corners, Wis., assignor to Automatic Electric Laboratories, Inc., Northlake, Ill., a corporation of Delaware

Filed Feb. 6, 1969, Ser. No. 797,161
Int. Cl. H04m 3/22
U.S. Cl. 179—18 7 Claims



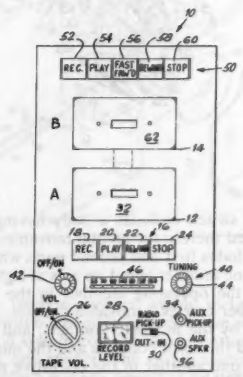
A circuit for monitoring the status of a plurality of relays includes a plurality of monitoring devices each having a control winding connected across a contact of a relay being monitored, and drive and sense windings connected to drive and detector circuits, respectively. The drive circuit includes a switching transistor which momentarily connects the drive windings of a plurality of devices to a current source permitting a current pulse to traverse the windings. If the contact being monitored is open the current pulse induces a voltage in the sense winding, but if the contact is closed the control winding is shunted out and only a noise pulse is induced in the sense winding. The switching transistor is controlled by a differential amplifier which compares a voltage fed back from the output of the switching transistor to a reference voltage, amplifies the difference, and regulates the base drive to the switching transistor to compensate for changes in the impedance of the monitoring devices and maintain the magnitude of the current pulse constant.

3,560,665
WORK STUDY RECORDING SYSTEM
Laurence Howard Pountney, Allestree, and Clifford R. Amsbury, King's Newton, England, assignors to Rolls-Royce Limited, Derby, England, a British Company
Filed Oct. 3, 1968, Ser. No. 764,692
Claims priority, application Great Britain, Oct. 7, 1967, 45982/67
Int. Cl. G11b 27/32, 31/00
U.S. Cl. 179—100.2 8 Claims



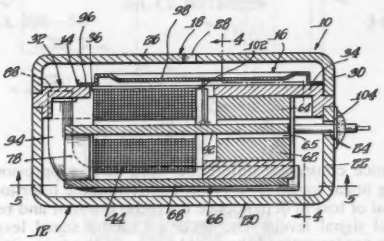
A work study recording system is described for analyzing a worker's performance of a production process or the like, consisting of a number of operations. The recording system includes an electrical information generating circuit connected to a recording means and a replay circuit also connected to the recording means for converting the recorded information into useable information. The electrical information generating circuit includes a transducer for converting spoken information into an electrical signal to be recorded, a means for generating electrical timing signals corresponding to the commencement and termination of each of the operations in the process which are recorded on the recording means and a manually operable means for recording further coded information on the recording means. The replay circuit receives the recorded signals from the recording means and measures the intervals between successive timing signals and it includes a printing device connected to receive signals from the replay circuit for printing the duration of each interval and the further coded information.

3,560,666
SINGLE DRIVE DUAL CASSETTE TAPE RECORDER WITH RADIO AND TAPE DUPLICATING
Jack Bookman, Orangeburg, N.Y., assignor to Telectronics Corporation of America, New York, N.Y., a corporation of New York
Filed Sept. 12, 1968, Ser. No. 759,280
Int. Cl. G11b 5/86, 15/28, 31/00
U.S. Cl. 179—100.11 4 Claims



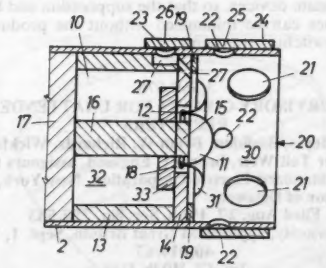
A cassette-type tape recorder comprising first and second cassette receiving means provided in spaced relationship to each other with a pair of magnetic playback assemblies operatively positioned with respect thereto. Single drive means are provided which are selectively operatively connected to each of the cassette receiving means, and controlling means are provided for selective actuation of the playback assemblies.

3,560,667
TRANSDUCER HAVING AN ARMATURE ARM SPLIT ALONG ITS LENGTH
Elmer Victor Carlson, Prospect Heights, Ill., assignor to Industrial Research Products Inc., Elk Grove Villiage, Ill., a corporation of Delaware
Filed May 1, 1968, Ser. No. 725,762
Int. Cl. H04r 11/06
U.S. Cl. 179—114 6 Claims



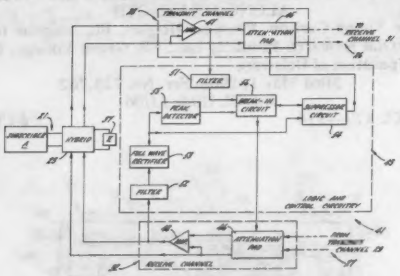
A transducer having a case and a coil mounted within the case. A pair of spaced magnets mounted in the case and spaced from the coil. An armature reed construction having a first elongated arm split along length with one end of the arm magnetically connected to the pair of spaced magnets. A pair of opposed bridges connected to the other end of the elongated arm. A second elongated arm having one end connected to the pair of bridges to form a substantially rigid section between the elongated arms. The second elongated arm positioned through the coil and between the spaced magnets.

3,560,668
MICROPHONE HAVING COUPLED ACOUSTIC CIRCUITS
Paul-Friedrich Warning, Mellendorf, Germany, assignor to Sennheiser Electronic, Bissendorf, Germany
Filed Oct. 24, 1966, Ser. No. 588,796
Claims priority, application Germany, Oct. 25, 1965, 100188
Int. Cl. H04r 1/28
U.S. Cl. 179—138 16 Claims



A microphone having a response characteristic in a set frequency range and a reinforced response at the upper limit of this range and comprising a housing containing an electroacoustic transducer with at least one diaphragm for producing output signals as a function of the sound striking the diaphragm and a substantially cylindrical acoustic resonance chamber coupled to the diaphragm. The opening to the acoustic resonance chamber forms the main sound inlet opening, and at least one group of subsidiary sound inlet openings are formed in the chamber walls.

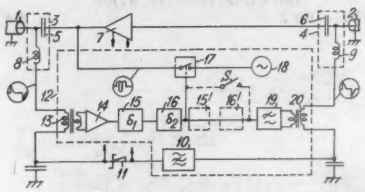
3,560,669
ECHO SUPPRESSOR
John D. Foulkes, Lexington, and Warren G. Bender, Wellesley, Mass., assignors to Wescom, Inc., Downers Grove, Ill., a corporation of Illinois. by mesne assignment
Filed Feb. 25, 1969, Ser. No. 802,067
Int. Cl. H04b *3/24*
U.S. Cl. 179—170.6 **23 Claims**



A voice controlled differential split echo suppressor employing linear logic circuitry for controlling the insertion and removal of loss in dependence upon the transmit and receive channel signal levels. The receive channel signal level exceeds a predetermined threshold level and the transmit channel signal level is below the receive channel average peak signal level, a relatively large suppression loss is immediately inserted into the transmit channel for operation of the echo suppressor in a suppression mode. Absent break-in by the near end subscriber, the echo suppressor remains in its suppression operating mode after the receive channel signal level falls below the threshold level until a predetermined suppression hangover time runs out at which time the suppression loss is removed and the echo suppressor is returned to operation in a quiescent mode. On the other hand, when the receive channel signal level is above the threshold level and the transmit channel signal level rises above the receive channel average peak signal level, the suppression loss is immediately removed from the transmit channel and a break-in loss, which increases with time from an initial negligible level to a final relatively low level, is inserted into the receive channel for operation of the echo suppressor in a break-in mode. The echo suppressor remains in its break-in operating mode after the transmit channel signal level drops below the receive channel average peak signal level until a predetermined break-in hangover time runs out, despite changes in the receive channel signal level. The suppression and break-in losses are provided by solid state devices which are switched from conductive to nonconductive states by still other solid state devices, so that the suppression and break-in operate times can be minimized without the production of significant switching transients.

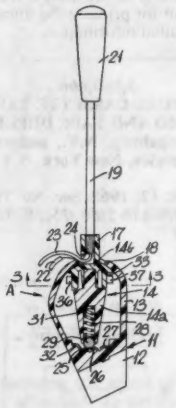
3,560,670
SUPERVISORY CIRCUIT FOR UNATTENDED REPEATERS
Roger W. Heyes, Basildon; Brian W. Richards, Wickford, and Alexander Tait Weir, Bromley, England, assignors to International Standard Electric Corporation, New York, N.Y., a corporation of Delaware
Filed Aug. 27, 1968, Ser. No. 755,583
Claims priority, application Great Britain, Sept. 1, 1967, 40,019/67
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.31 **7 Claims**

A supervisory system for a plurality of repeaters in a carrier current communication system wherein the transmission path includes a first frequency band to provide operating power for the repeater stations and a second frequency band for transmitting information signals. An interrogation signal separate from the operating power is sent from one terminal station to the nearest repeater station in the first frequency band. The interrogation signal is extracted from the path, delayed a predetermined time interval and then sent to the next repeater station for similar operation on the interrogation signal. In each repeater station, the delayed interrogation signal causes a response signal to be transmitted along the path back to said one terminal station. Said one terminal station counts the number of response signals and measures the amplitude of selected ones of the response signals. If the



number of response signals does not equal a predetermined number, an alarm signal is generated indicating a fault in one of the repeater stations. The amplitude measurement will indicate the faulty repeater station due to the amplitude of its response signal not achieving a predetermined amplitude.

3,560,671
ELECTRICAL SWITCH WITH IMPROVED OPERATING MEANS
Edward Cryer, Higham, Near Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed May 13, 1969, Ser. No. 824,135
Claims priority, application Great Britain, May 21, 1968, 24,156/68
Int. Cl. H01h *19/00, 3/00*
U.S. Cl. 200—6 **6 Claims**

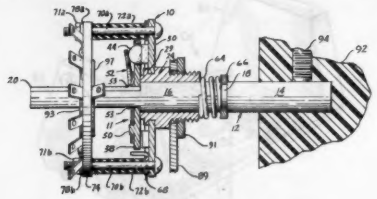


An electrical switch includes a body having an operating member mounted therein for pivotal movement. The operating member includes first and second parts which are rotatable relative to one another about an axis at right angles to the pivotal axis of the operating member in the body, and the operating member carries a movable contact. Fixed contacts are engageable by the movable contacts, and are supported on the body and the fixed contacts and the movable contacts cooperate with one another in the operative positions of the switch to maintain the operating member in any one of the operative positions. The switch further includes further contacts operable in response to rotation of the two parts of the operating member relative to one another.

3,560,672
GUARDED POSITION SELECTOR SWITCH WITH STOP POSITION MEANS

Raymond W. Ludlum, Blanchester, and David F. Warner, Brookville, Ohio, assignors to Ledex, Inc., Dayton, Ohio, a corporation of Ohio

Filed Jan. 21, 1969, Ser. No. 792,384
Int. Cl. H01h 3/52
U.S. Cl. 200—11 7 Claims

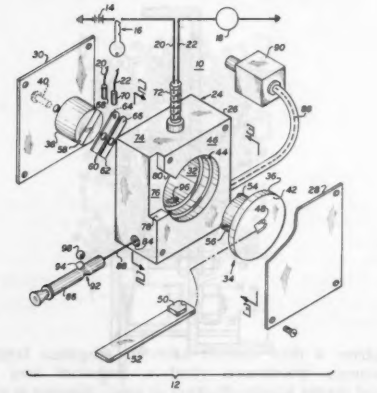


A rotary circuit selector switch is provided with a limited range of unguarded switch positions by fixing a radially extending abutment to the operating shaft for the switch and fixing peripherally spaced axially extending stops to a stationary frame for the switch. The range of unguarded switch positions is determined by the space between the stops in which the abutment is free to reciprocate. A guarded switch position is provided by giving the shaft freedom for limited axial movement against an opposing spring and by shortening the axial length of one of the stops so as to permit the abutment to pass the shortened stop when the shaft has been moved axially against the opposing spring. The guarded switch position is so named because a deliberate effort on the part of the switch operator is required to reach the guarded position.

3,560,673
ANTI-THEFT IGNITION SYSTEM

Max Norman Schweizer, 110 S. Clinton Ave., Bay Shore, N.Y., and Sam Barmherzig, 1457 E. 86th St., Brooklyn, N.Y.

Filed Feb. 24, 1969, Ser. No. 801,577
Int. Cl. H01h 27/00
U.S. Cl. 200—44 5 Claims

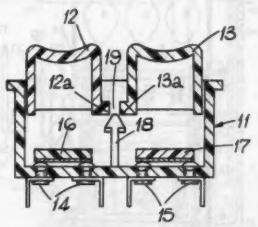


An antitheft ignition system which includes a simple, tamper-proof, switch assembly connected in series in a conventional ignition system comprised of a battery, ignition key operator switch, and starter. The switch assembly includes a housing within which is a key operated rotatable contact carrier which carries a set of movable contacts which engage or disengage a pair of stationary contacts carried on the interior of the housing depending on the position of the contact carrier. Thus, the operator must have both the automobile ignition key and a switch assembly operating key in order to start the vehicle. In addition, the switch assembly also carries an actuating member for permitting the trunk or hood to be opened, which actuating member can only be operated when the switch assembly key is inserted in the switch to rotate the contact carrier from a "break" to a "make" position.

3,560,674
DUAL ROCKER SWITCH ASSEMBLIES INCLUDING BLOCKING MEANS FOR PREVENTING SIMULTANEOUS OPERATION OF BOTH SWITCHES

Keith Lewis, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England, a British Company

Filed July 9, 1969, Ser. No. 840,339
Claims priority, application Great Britain, July 15, 1968, 33619/68
Int. Cl. H01h 9/24
U.S. Cl. 200—50 3 Claims

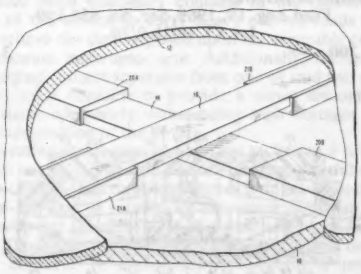


Dual rocker switch assembly in which each switch is provided with an operating member for moving a movable contact into engagement with a fixed contact. A blocking piece located adjacent the operating members is operative upon movement of one of the members to move its movable contact into engagement with the fixed contact to be positioned in the path of movement of the other operating member to prevent its movement.

3,560,675
DEPRESSIBLE DIAPHRAGM OVERLAY SWITCH FOR DISPLAYS

Morris Krakinowski, Ossining, and George R. Stilwell, Jr., West Nyack, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed May 26, 1969, Ser. No. 827,586
Int. Cl. H01h 43/08
U.S. Cl. 200—46 7 Claims



A two layer planar multicontact switch including a first substrate layer having a plurality of parallel conductive lines deposited on the upper surface thereof and a second diaphragm layer located over the substrate layer and having a plurality of parallel conductive lines deposited on the lower surface thereof. The conductive lines on the substrate are normal to the conductive lines on the diaphragm such that a plurality of matrix switch intersections are formed. The con-

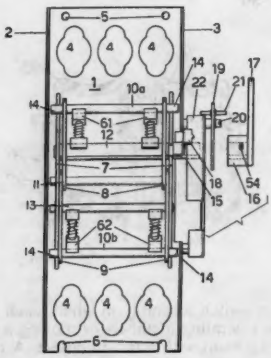
ductive lines on the substrate and the diaphragm have insulating material selectively deposited thereon to electrically isolate the upper and lower conductive lines except at the points of intersection. The diaphragm layer may be mechanically depressed at the intersection points to selectively connect the upper lines with the lower lines to form switch closure contacts. The diaphragm and the substrate are formed from transparent material so that the switch can be employed in combination with a visual display.

3,560,676

EXTRACTING DEVICE FOR APPARATUSES

Mario Battaglia, Milan, Italy, assignor to General Electric Company, New York, N.Y., a corporation of New York

Filed Mar. 26, 1969, Ser. No. 810,741
Claims priority, application Italy, Apr. 8, 1968, 14,953/68
Int. Cl. H01h *9/24*
U.S. Cl. 200—50 **5 Claims**



A drawout type circuit breaker assembly in which a spring-biased trip member is normally held in an inactive position, but which is released to cause tripping of the circuit breaker whenever a removable handle for the drawout mechanism is mounted in place to assure that the breaker will be in open condition whenever the drawout mechanism is actuated.

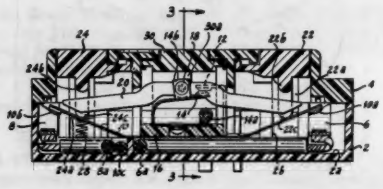
In another aspect, the drawout mechanism includes two slidable rods supporting the circuit breaker, and two pairs of toggle links operating the rods.

3,560,677

INTERLOCK BAR FOR MEMENTARY SELECTOR SWITCH

Arthur F. Kolb, Mequon, and Robert O. Graham, Milwaukee, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis., a corporation of Delaware

Filed Aug. 19, 1969, Ser. No. 851,199
Int. Cl. H01h *9/20*
U.S. Cl. 200—50 **3 Claims**



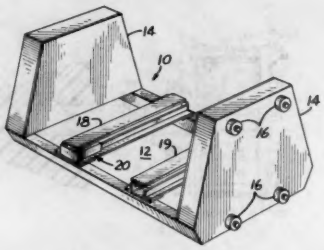
The outer buttons of a three-position, center-off switch are interlocked by an interlock bar pivotally mounted to the movable contact under the center button. The opposite ends of the bar underlie the outer buttons wherein depression of both outer buttons drive the bar downward to open the center contact before both outer contacts will close.

3,560,678

LOAD PRESENCE DETECTOR LEVER MOUNTED FOR PIVOTAL AND LONGITUDINAL MOVEMENT

Raymond H. Richardson, Chicago, Ill., assignor to Interlake Steel Corporation, Chicago, Ill., a corporation of New York

Filed Nov. 4, 1968, Ser. No. 773,115
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.44 **16 Claims**



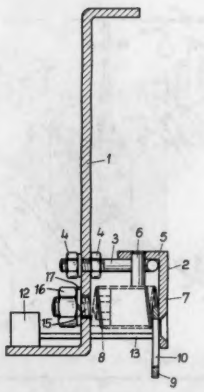
A load presence detector for a power-operated load handling fork assembly comprises a rotatable, longitudinally displaceable lever member. When the power-operated fork is extended, the lever member is rotated about a pivot axis and, if the storage space into which it is desired to deposit the load being carried by the forks is already occupied by another load, the rotated lever member contacts the load in the space and moves in a longitudinal direction to terminate power to the fork. If the space is unoccupied, the lever member rotates further about its pivot to allow the fork to deposit the load in the unoccupied space.

3,560,679

SAFETY DEVICES FOR MOVABLE STORAGE UNITS

Rudi Kombuchen, Dusseldorf, Germany, assignor to Acrow (Automation) Limited, London, England, a corporation of England

Filed June 25, 1969, Ser. No. 836,427
Claims priority, application Germany, Aug. 31, 1968, P 17 63 891.1
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.44 **6 Claims**



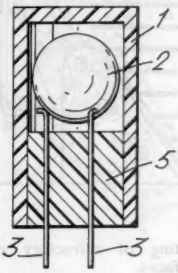
A safety device for a movable storage unit driven by an electric motor including a safety member pivotally suspended from the movable storage unit and an actuator connected with the safety member for controlling the operation of the electric motor such that pivotal movement of the safety member deenergizes the electric motor and stops the movable storage unit.

3,560,680

INERTIA SWITCH RESPONSIVE TO HIGH AND LOW LEVEL SHOCKS

Walter W. H. Clarke, Eversley, England, assignor to C.B. Associates Limited

Filed Apr. 18, 1969, Ser. No. 817,504
Claims priority, application Great Britain, Apr. 19, 1968, 18,722/68
Int. Cl. H01h 35/14
U.S. Cl. 200—61.45 8 Claims



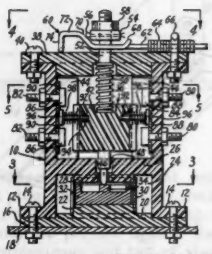
The invention concerns an inertia switch in the form of a sphere supported normally on a seat formed by three pins, two of which form electrical contacts. Upon dislodgement of the sphere upon a vibration of the switch a circuit between two of the contacts is broken whereby to actuate a device, such as a burglar alarm, controlled by the switch. The construction offers a simple and inexpensive yet extremely sensitive switch.

3,560,681

IMPACT CIRCUIT BREAKER FOR MOTOR VEHICLES

Milo R. Webber, 12235 Spring Trail, San Fernando, Calif.

Filed May 28, 1969, Ser. No. 828,636
Int. Cl. H01h 35/14
U.S. Cl. 200—61.45 6 Claims



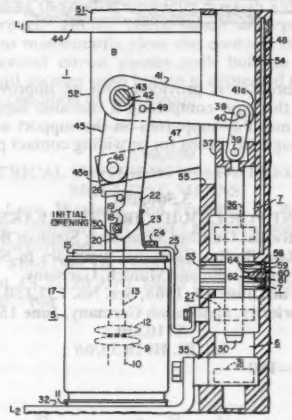
A vertical casing is provided therein with a vertically movable unit including a body operatively connected preferably at opposite sides to normally closed circuit breaking elements to properly complete the circuit from the positive sides of the generator and battery. The unit is normally supported in circuit closing position by an inertia element arranged in the bottom of the casing and adapted to be displaced laterally due to an impact occurring if the vehicle is in an accident. Under such conditions, a biasing spring moves the unit downwardly to break the circuits preferably from both the generator and battery. Manually operable means is provided for moving the unit upwardly to break the circuit to prevent the theft of the vehicle.

3,560,682

VACUUM INTERRUPTER WITH SHUNTING MAIN CONTACT STRUCTURE AND SERIES DISCONNECTING CONTACT STRUCTURE

Werner Kohler, and Hans-Joachim Grunefeld, Berlin, Germany, assignors to Siemens-Schuckertwerke Aktiengesellschaft, Erlangen, Germany, a corporation of Germany

Filed Nov. 7, 1966, Ser. No. 592,647
Claims priority, application Germany, Nov. 30, 1965, 1,265,815
Int. Cl. H01h 9/38, 33/12
U.S. Cl. 200—144 9 Claims



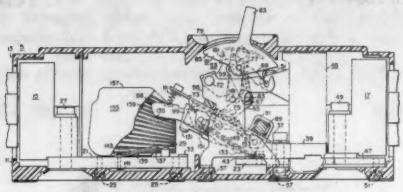
A vacuum-type circuit interrupter is provided having an electrically shunting main contact structure, comprising two spaced main stationary contacts associated therewith, and located externally of the vacuum envelope. The spaced main stationary contacts are electrically connected to the opposite terminals of the vacuum interrupter unit.

A movable main bridging contact electrically bridges the two spaced main stationary contacts in the closed-circuit position of the device to carry heavy current loads and to thereby relieve the duty imposed upon the separable contacts of the vacuum interrupter unit. Additionally, the movable main bridging contact separates from one of said two spaced stationary main contacts to provide a series disconnecting gap for more adequately withstanding high voltages in the open-circuit position of the device.

An operating mechanism is provided including a rotatable crank arm having the pivotal point of attachment of the moving contact of the vacuum interrupter unit positioned more closely to the axis of rotation of the crank arm than is the pivotal point of attachment of the movable main bridging contact. This varies the distance of opening travel between the two contacts. A lost-motion connection if provided between the operating link for the vacuum interrupter unit and a member secured to the movable operating rod of the vacuum-interrupter unit. This is released by camming at the end of the opening stroke to permit reclosure of the separable contacts of the vacuum interrupter unit by spring means.

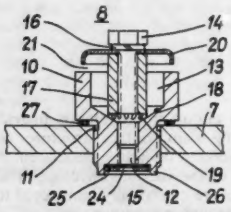
The disconnecting gap may be provided with a plurality of contiguous insulating plates to provide a corrugated internal surface for a greater electrical creepage path across the series disconnecting gap in the open-circuit position of the interrupting device.

3,560,683
CIRCUIT BREAKER WITH IMPROVED CONTACT STRUCTURE
Alfred E. Maier, Beaver Falls, Pa., and Albert R. Cellerini, Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania
Filed Jan. 24, 1968, Ser. No. 700,248
Int. Cl. H01h *33/12*
U.S. Cl. 200—146 **25 Claims**



A circuit breaker is provided with an improved contact structure of the type comprising a movable support and a contact arm movably supported on the support with current responsive magnetic means for providing contact pressure.

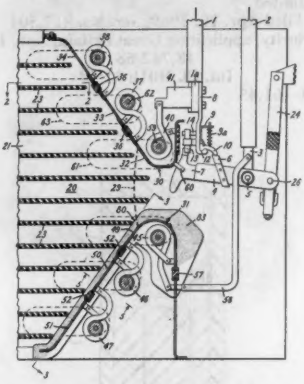
3,560,684
VENT FOR LIQUID CIRCUIT BREAKER
Furdoon Battiwala; Gunther Sinnecker; Stephan Boerger, and Gerd Pawlak, Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed June 14, 1968, Ser. No. 737,150
Claims priority, application Germany, June 15, 1967, S110330
Int. Cl. H01h *33/68*
U.S. Cl. 200—150 **11 Claims**



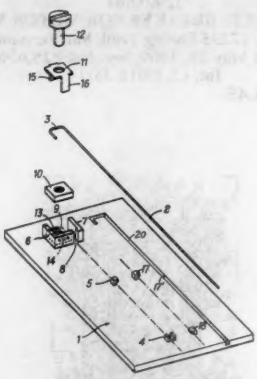
A liquid circuit breaker is equipped with an exhaust vent that has a part which is provided with a tapped bore for receiving a screw. The bore and screw form a helical passage for directing gas away from the circuit breaker while at the same time preventing discharge of the liquid.

3,560,685
ARC CHUTE FOR AN ELECTRIC CUIRCUIT BREAKER
Cecil Bailey, Woodlyn; Oscar C. Frederick, Springfield, and Joseph L. Talento, Media, Pa., assignors to General Electric Company, a corporation of New York
Filed May 26, 1969, Ser. No. 827,583
Int. Cl. H01h *9/30, 33/00*
U.S. Cl. 200—144 **7 Claims**

Discloses an arc chute having spaced sidewalls of a first insulating material and arc runners having most of their active surfaces of a refractory metal. Between one of the runners and the sidewalls are two face plates of a second insulating material, such as glass-bonded mica, that is characterized by low gas evolution and greater surface resistivity than said first material under high humidity conditions. The face-plate surfaces adjacent an arc are shielded from the arc by a thermally-sprayed coating of refractory ceramic insulating material on said surfaces.



3,560,686
APPARATUS INCLUDING A CONDUCTOR SUPPORTED BY AN INSULATING SUPPORT
Josef Hofer, and Gunter Haage, Wien, Austria, assignors to International Standard Electric Corporation, New York, N.Y., a corporation of Delaware
Filed Apr. 26, 1968, Ser. No. 724,572
Claims priority, application Austria, Apr. 28, 1967, 4064/67
Int. Cl. H01h *1/58*
U.S. Cl. 200—166 **7 Claims**

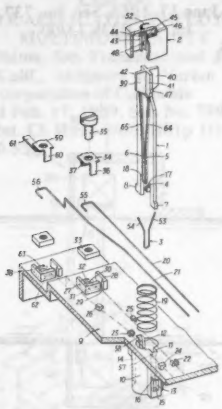


An arrangement for securing an elongated resilient wire conductor to an insulating base having integral guide means associated therewith.

3,560,687
CROSS-STRING TELEPHONE EMPLOYING PUSHBUTTONS
Josef Hofer, and Guenter Haage, Wien, Austria, assignors to International Standard Electric Corporation, New York, N.Y., a corporation of Delaware
Filed Apr. 26, 1968, Ser. No. 724,574
Claims priority, application Austria, Apr. 28, 1967, 4065/67
Int. Cl. H01h *3/12*
U.S. Cl. 200—166 **7 Claims**

A pushbutton is provided for use with cross-string conductors supported on a base plate. The elements of the pushbut-

ton are made so that they may be assembled and attached to the board without the use of separate fasteners. Contact is completed between cross-string conductors on the base plate

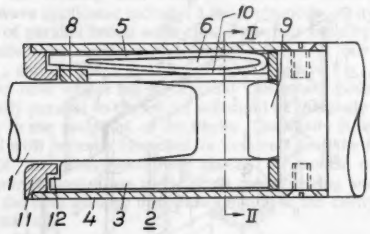


when a part of the push button, i.e., a V-shaped spring, touches them. The pushbutton incorporates a spring which biases it to a neutral position when it is not pressed against the conductors.

3,560,688
CONTACT MEANS FOR ELECTRIC CIRCUIT BREAKERS

Sven Bachler, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden, a Swedish Corporation

Filed May 12, 1969, Ser. No. 823,770
Claims priority, application Sweden, May 15, 1968, 6525/68
Int. Cl. H01h *1/44, 1/50*
U.S. Cl. 200—166 **8 Claims**



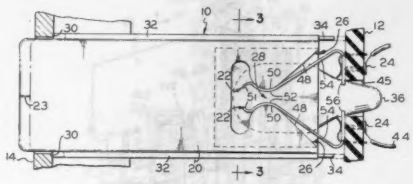
A contact arrangement for circuit breakers includes a movable contact plug and a stationary sheath contact. In the sheath contact, a plurality of contact fingers are arranged in ring formation and are pressed against the contact plug by means of leaf springs punched out of sheet material. Each leaf spring is loosely inserted in a longitudinal groove in the associated contact finger in such a way that the spring action occurs in the plane of the spring.

3,560,689
PUSHBUTTON SWITCH HAVING CAM ACTUATED SPRING CONTACTS ALSO ACTING AS RESILIENT SUPPORT FOR PUSHBUTTON

Arthur H. Matson, Portland, Oreg., assignor to Tektronix Inc., Beaverton, Oreg., a corporation of Oregon

Filed Dec. 4, 1968, Ser. No. 781,024
Int. Cl. H01h *9/18*
U.S. Cl. 200—167 **12 Claims**

A pushbutton switch apparatus having cam actuated spring contacts is described in which such contacts also function as resilient supports on which the pushbutton member is mounted and urged into its normal extended position. The switch contacts are attached directly to a printed circuit board, as is a light bulb which is positioned inside the pushbutton member for illuminating such member. The light bulb

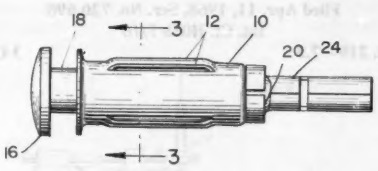


is energized by the switch indirectly through a control circuit on the printed circuit board when the pushbutton is depressed to momentarily close the contacts of such switch and the control circuit causes such bulb to remain illuminated until another push button is depressed to change the conductive condition of such circuit.

3,560,690
ELECTRICAL SWITCH WITH LOWERED PANEL MOUNTING MEANS

Edward J. Luce, Wayland, and Frederick J. Weremey, Milton, Mass., assignors to United-Carr Incorporated, Boston, Mass., a corporation of Delaware

Filed Dec. 18, 1968, Ser. No. 784,772
Int. Cl. G12b *9/10;* **H02b** *1/04;* **H01h** *9/08*
U.S. Cl. 200—168 **3 Claims**



This is a door switch housing in which the body of the housing has either louvers or other movable parts which react under tension in an aperture to allow lateral movement of the housing while providing tight interference fit.

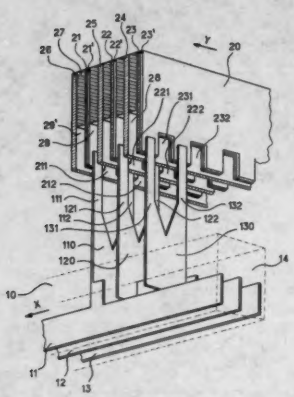
3,560,691
SWITCHES WITH SELECTION BY CO-ORDINATES

Pierre M. Lucas, 20 rue Tariel, Issy-Les-Moulineaux; Auguste A. Sautel, 13 rue Anatole France, Bonneuil-sur-Marne, and Serge M. Choupik, 1 rue des Fauvettes, 91 Ris-Orangis, France

Filed July 14, 1969, Ser. No. 841,518
Claims priority, application France, July 26, 1968, 160,690
Int. Cl. H01h *67/26*
U.S. Cl. 200—177 **5 Claims**

Crosspoint matrix for an electrical switch for selection by coordinates comprising a first set of conductive parallel bars located in a common plane and each carrying resilient forks and a second set of conductive parallel bars adapted to establish contact with said forks, this second set of bars being located in a plane spaced from the said common plane and parallel thereto. The bars of the second set have one conductive and one insulating surface against which the forks bear in make and idle positions respectively, with notches through the bars of the second set to allow the forks to pass through.

The bars of the second set also have unnotched insulating bars intercalated between them to define with them receiving



spaces comprised alternatively of two insulating surfaces and one insulating and one conducting surface.

3,560,692

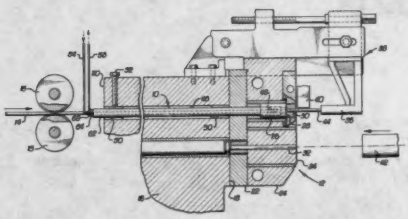
INDUCTION-HEATING APPARATUS FOR COLD HEADER

Franklin S. Briles, 6 Middleridge Road North, Rolling Hills, Calif. 90274

Filed Apr. 11, 1968, Ser. No. 720,698

Int. Cl. H05b *5/10*

U.S. Cl. 219—7.5 **3 Claims**



An induction-heating unit of elongated tubular form for guiding rod or wire stock to a remote, generally inaccessible region and heating the stock when it reaches such remote location. The induction unit includes an elongated tubular body for carrying the high frequency induction current and guiding the rod or wire stock to a forward tubular induction head wherein the stock is heated as it passes therethrough, the body including a pair of concentric tubular conducting cases along which the respective induction heater conductors are affixed, the cases being separated by insulation material and the inner case having a tubular core of insulation material through which the stock is guided. This induction-heating unit has particular utility combined with a cold header for heating the stock within the cutoff quill to adapt a cold header for hot cutoff and heading.

3,560,693

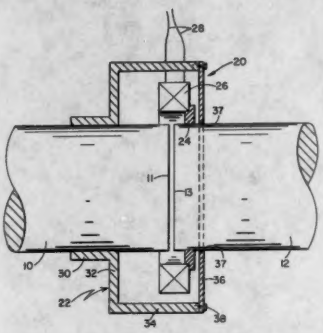
MAGNETIC WELDING AND FORMING

Theodore Joseph Morin, Jr., Needham, Mass., assignor to Industrial Magnetics, Inc., Canton, Mass., a corporation of Massachusetts

Filed June 17, 1968, Ser. No. 737,651

Int. Cl. B23k *13/00*

U.S. Cl. 219—9.5 **7 Claims**



Apparatus for driving members toward each other with repulsive magnetic forces and including a magnetic driver, a magnetic coil and a connector secured to either the coil or driver and adapted to be secured to one of the members.

3,560,694

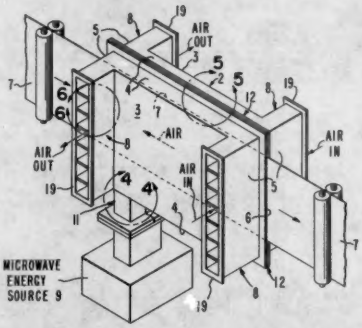
MICROWAVE APPLICATOR EMPLOYING FLAT MULTIMODE CAVITY FOR TREATING WEBS

Jerome R. White, San Carlos, Calif., assignor to Varian Associates, Palo Alto, Calif., a corporation of California

Filed Jan. 21, 1969, Ser. No. 792,557

Int. Cl. H05b *9/06, 5/00*

U.S. Cl. 219—10.55 **8 Claims**



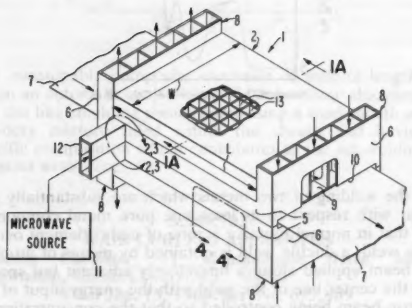
A microwave applicator is disclosed. The applicator includes a flat multimode cavity having openings on opposite sides thereof for passing therethrough a web of material to be treated with microwave energy. The cavity is both designed and fed so as to be excited at its operating frequency only in those $TE_{l,\ m,n}$ and $TM_{l,\ m,n}$ classes of modes such that the value of l is limited to 1 and m or n or both have a value greater than zero (preferably both m and n have a range of values which includes 10) and such that the E-vector of the microwave energy lies generally in the plane of the treatment zone and has maximum intensity in the treatment zone. The flat multimode cavity resonator is fabricated in two half sections an upper half and a lower half which are joined together at their edges. A mode-damping means is provided for attenuating a certain undesired class of modes that could otherwise be supported within the cavity. Air ducts are pro-

vided at opposite ends of the resonator for directing air either parallel or antiparallel to the direction of movement of the web to be treated.

3,560,695
MICROWAVE APPLICATOR EMPLOYING A FLAT MULTIMODE CAVITY

Norman H. Williams, San Francisco, and Jerome R. White, San Carlos, Calif., assignors to Varian Associates, Palo Alto, Calif., a corporation of California

Filed Feb. 17, 1969, Ser. No. 799,828
Int. Cl. H05b *9/06;* **H01p** *1/16*
U.S. Cl. 219—10.55 **13 Claims**



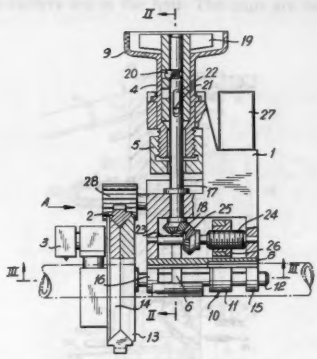
A microwave applicator is disclosed which is especially useful for treating thin films of dielectric material. The microwave applicator includes a flat multimode cavity having a pair of parallel broad walls closed on their sides by narrow sidewalls. The cavity is preferably excited in one of the $TE_{l,m,n}$ and/or $TM_{l,m,n}$ classes of modes, where l is 1, with an electric field vector of the excited classes of modes being generally parallel to the broad walls and of relatively high intensity in the midplane of the cavity. The cavity is reactively loaded with periodic elements for concentrating the frequencies of the aforementioned classes of modes near the frequency of operation to facilitate mode-stirring and to improve the time average impedance match to the cavity during mode stirring.

3,560,696
DEVICE FOR ORBITAL WELDING OF BUTT JOINTS OF PIPES

Vladimir Ivanovich Grinenko, Ulitsa Inzhenernaya, 10, Korpus 1, Kv. 10; Viktor Viktorovich Shefel, Vyatskaya Ulitsa, 1, Kv. 86; Viktor Petrovich Rybkin, Ulitsa Standartnaya, 3, Kv. 3, and Vladimir Petrovich Bogachev, Ulitsa Fonvizina, 14, Kv. 40, Moscow, U.S.S.R.

Filed June 20, 1968, Ser. No. 738,682
Claims priority, application U.S.S.R., June 26, 1967, 1,166,263
Int. Cl. B23k *9/02*
U.S. Cl. 219—60 **3 Claims**

A device for the orbital welding of butt joints of pipes. The device comprises a body adapted for being removably secured on one of the pipes being welded. Guides are provided which extend in longitudinal direction in the body. The pipe is arranged along the guides. A slide block is mounted on the guides so that displacement of the slide block along the pipe axis can be effected. A drive is mounted on the stationary body and is adapted to displace the slide block on the guides. Circular guides are provided on the slide block and are arranged transversely with respect to the guides. A

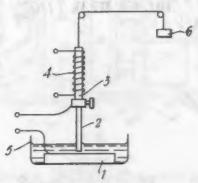


faceplate is mounted in the circular guides and supports a torch which orbits around the pipes at the butt joint thereof.

3,560,697
ADDING SPARK-COMMINUTED ZINC TO TOBACCO-SMOKE FILTERS

Thomas William Charles Tolman, Southampton, England, assignor to Brown and Williamson Tobacco Corporation, Louisville, Ky., a corporation of Delaware

Filed Aug. 6, 1968, Ser. No. 750,656
Claims priority, application Great Britain, Aug. 9, 1967, 36520/67
Int. Cl. B23p *1/08;* **A24f** *25/00*
U.S. Cl. 219—69 **7 Claims**



The invention concerns a method and apparatus for improving the filtration properties of fibrous, filamentary and sheet tobacco smoke filtering material. The method consists in treating the said material with a finely divided zinc-containing powder produced by a high-energy comminution process carried out under water. The powder is advantageously a powder produced by electric-spark erosion action between two zinc electrodes submerged in water.

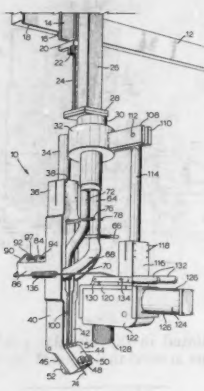
3,560,698
ADJUSTABLE WELDING HEAD ARRANGED TO FOLLOW A LAPPED SEAM

Ronald E. Taylor, Tandridge, and Joseph Manuel Tanenbaum, 4 Dewborune Ave., Toronto, 10 Ontario, Canada

Filed Jan. 27, 1969, Ser. No. 794,108
Int. Cl. B23k *9/12*
U.S. Cl. 219—125 **7 Claims**

A welding head assembly has a pair of rigidly connected, bifurcated, open-ended tubes with rollers which bear against one side of a plate projecting from the base plate to which it

is to be welded. A weld wire emerges between the ends of the bifurcated tubes which carry a supply of flux to surround the tip of the weld wire. The assembly also has a downwardly de-



pending arm which has a drive wheel. The arm is pivotably biassed so that the drive wheel bears against the other side of the plate with the result that the drive wheel propels the welding head assembly.

3,560,699

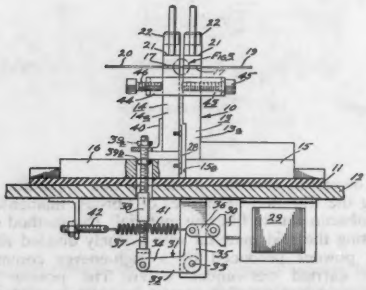
WELDING APPARATUS

Walter J. Draving, Willow Grove; Robert C. Draving, Fort Washington; Alexander Patton, Jr., and Joseph E. Nerz, Philadelphia, Pa., assignors to Micro-Miniature Parts Corporation, Willow Grove, Pa., a corporation of Pennsylvania

Filed Sept. 29, 1967, Ser. No. 671,776

Int. Cl. B23k *11/02*

U.S. Cl. 219—103 **12 Claims**



This patent application discloses special apparatus for effecting a butt weld between small workpieces such as wire. The apparatus disclosed includes holders for the workpieces, at least one of which is pivoted for bringing the workpieces together and useful in conjunction with a novel welding pack disclosed herein and claimed in the copending patent application Ser. No. 671,798, filed Sept. 9, 1967 simultaneously herewith, which welding pack utilizes a secondary capacitor to shunt the holders when the holders are coupled to a direct current power source.

3,560,700

ELECTRON BEAM WELDING OF TWO DISSIMILAR METALS

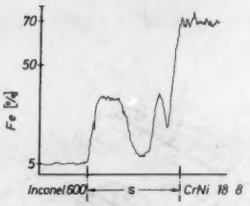
Werner Andreas Reidelsturz, Staffort; Dieter Rodrian, Karlsruhe, and Willy Franz Edmund Scheibe, Leopoldshafen, Germany, assignors to Gesellschaft Fur Kernforschung MBH, Weberstrasse, Germany, a corporation of Germany

Filed July 17, 1968, Ser. No. 745,576

Claims priority, application Germany, July 18, 1967, P 16 15 280.0

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 **2 Claims**



In the welding of two metals which are substantially dissimilar with respect to at least one pure metal component such that in normal practice a zone of embrittlement occurs in the weld, a ductile weld is obtained by means of an electron beam applied along a line closely adjacent but spaced from the center line of the weld with the energy input of the electron beam being controlled so that the concentration of the pure metal component in the finished weld remains substantially constant across the width of the weld except for a very fine zone of transition at the edge of the weld wherein it changes to equal the concentration of that component in one of the two metals.

3,560,701

DEVICE FOR WELDING TUBES TO PLATES

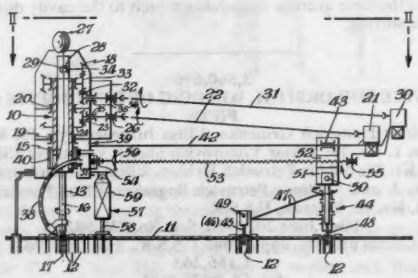
Siegfried Hahne, Grafschafterstr, Germany (Messer Griesheim GmbH Frankfurt am Main Hanauer Landstr 300 Germany)

Filed Sept. 10, 1968, Ser. No. 769,449

Claims priority, application Germany, Oct. 14, 1967, 75,887

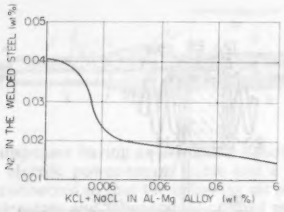
Int. Cl. B23k *9/12*

U.S. Cl. 219—125 **12 Claims**



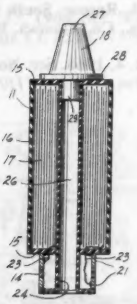
A device for the automatic welding of tubes or the like to plates or the like includes a welding unit and a holding unit connected together by a crossbar. The device is characterized by having the holding unit supported on the work piece per se.

3,560,702
COMPOSITE ELECTRODE FOR CONSUMABLE ELECTRODE ARC WELDING PROCESS
Masayasu Arikawa; Motomi Kano, Fujisawa-shi, and Sho Horiuchi, Kamakura-shi, Japan, assignors to Kobe Steel Ltd., Hyogo-ken, Japan, a corporation of Japan
Filed Feb. 24, 1969, Ser. No. 801,690
Claims priority, application Japan, Mar. 2, 1968, 43/13520
Int. Cl. B23k *35/22*
U.S. Cl. 219—146 **6 Claims**



A consumable composite electrode of infinite length for use in an automatic arc-welding of steel without shielding gas and the like shielding means comprising a steel sheath and a powdery mixture filled within the sheath and having a specific composition which contributes to the arc-welding of the steel workpiece.

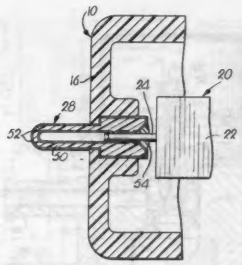
3,560,703
HAIR CURLING APPARATUS
Conkling Chedister, 11 Mountainside Drive, Morris Township, Morris County, N.J. 07960
Filed Jan. 15, 1968, Ser. No. 697,809
Int. Cl. A45d *2/36;* **H05b** *1/02*
U.S. Cl. 219—222 **12 Claims**



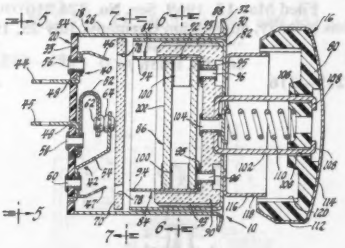
A new and improved preheated curler having a unique heating means incorporated therein. The curler includes an insulating jacket having an internal insulating sleeve extending axially therealong with the heating means encapsulated therebetween, wherein the heating means comprises the greatest mass of the curler. The curler is inserted into an energizing unit having thermostatic control means which engages the sleeve and limits the curler temperature to a predetermined value. The curler is rapidly heated to the predetermined temperature which can be a relatively high temperature and, since the heating means is contained within an insulating jacket, it may be applied to the hair before becoming warm to the touch. The curler also retains and provides heat for a relatively long period of time.

3,560,704
ELECTRICALLY HEATED HAIR CURLER
John R. Albert, 8425 Cherakee Lane, Leawood, Kans. 66206
Continuation-in-part of application Ser. No. 782,214, Dec. 9, 1968, now abandoned. This application Apr. 2, 1969, Ser. No. 812,610
Int. Cl. A45d *2/36, 4/12;* **H05b** *1/00*
U.S. Cl. 219—222 **3 Claims**

Tubular hair curlers containing electric heating elements with capped terminals are heated on a support having conductor bars across which the curlers are laid. A series of curlers are heated simultaneously to about 170° F. in 6 to 7 minutes, the heat loss being only about 1° F. per minute while the curlers are in the hair. The caps are made to conduct electric current but are highly resistant to heat transfer. The caps are in the form of metallically coated insulators electrically connected to the heating element terminals through use of a metallized adhesive or a spring clip.



3,560,705
CIGARETTE LIGHTER FOR DOMESTIC APPLIANCES
Charles A. Mendenhall, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware
Filed Aug. 25, 1969, Ser. No. 852,687
Int. Cl. F23g *7.14*
U.S. Cl. 219—265 **5 Claims**

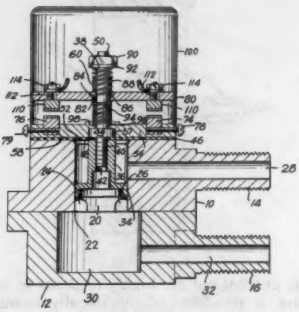


A cigarette lighter for use in a domestic appliance includes a receptacle having a contact assembly mounted at one end and an igniting plug slidably received in the other end, the igniting plug including a hollow rectangular heating element which is electrically connected to a pair of downwardly projecting contacts. A ceramic shield disposed within the receptacle isolates the contact assembly from manual contact and includes apertures through which the terminals extend into engagement with the contact assembly for energizing the heating element. The contact assembly further includes a bimetal thermostat that is responsive to radiant energy and operative to open the igniting circuit to the heating element under predetermined operating conditions as sensed through slots formed in the insulating shield.

3,560,706
ELECTRIC FLUID HEATER AND FLOW RESPONSIVE SWITCH THEREFOR
Eduardo J. A. Fonseca, Avenida Trapiche, Quinta Ofelia LaFloresta, Caracas, Venezuela
Filed Dec. 5, 1966, Ser. No. 599,222
Int. Cl. H01h *35/40;* **F24h** *1/20;* **H01b** *1/02*
U.S. Cl. 219—309 **2 Claims**

A hydraulic switch which functions upon change of hydraulic pressure which is created when a fluid enters the device or when a fluid is retained within said device. On the opening of a faucet situated on an outlet pipe of the device, the internal pressure reduces, thus allowing a piston to move.

Electrical contacts connected to said piston are displaced therewith for contact with fixed electrical contacts, thus closing a circuit and allowing application of electric power to a mechanism to be operated, e.g. a water heater, motor,

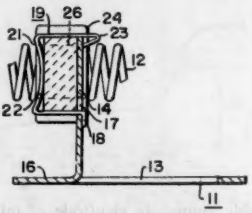


generator, engines, compressors, etc. A shaft is attached to the piston and is axially biassed by springs to normally hold the electrical contacts in spaced relation. When the piston is displaced, the springs are stressed.

3,560,707
HEATING RODS
Erwin Kolfertz, Turnerstrasse 22, Solingen-Merscheid, Germany
Filed May 15, 1969, Ser. No. 824,910
Claims priority, application Germany, July 25, 1968, P 17 65 842.3
Int. Cl. H05b *1/00*
U.S. Cl. 219—316 **4 Claims**

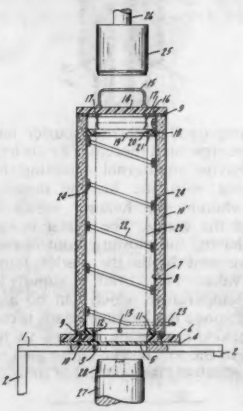
The invention is concerned with heating rods which are arranged to be suspended in and to heat the water in an aquarium, the rods consisting of a heating coil embedded in an insulating material within an outer protected glass tube. According to the invention the lower end of the glass tube is open and is sealed by a stopper within a protected cap which acts to cushion impact between the lower end of the glass tube and an aquarium wall.

3,560,708
HEATER COIL SUPPORT FOR ELECTRIC CLOTHES DRYERS
Clyde C. Fox, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania
Filed May 9, 1969, Ser. No. 823,369
Int. Cl. H05b *1/00, 3/06*
U.S. Cl. 219—357 **5 Claims**



The invention provides a heater support structure for a clothes dryer. The support structure is characterized by the utilization of lanced-out tabs, in the heater reflector pan, as an integral part of support structure for insulators which support the heater coil.

3,560,709
ELECTRICAL FURNACE FOR HEATING A METALLIC SLEEVE
William T. Crane, Geneva; Kenneth L. Landmark, St. Charles, and Paul A. Rosene, South Elgin, Ill., assignors to Burgess-Norton Mfg., Co., Geneva, Ill., a corporation of Illinois
Filed Oct. 4, 1968, Ser. No. 765,104
Int. Cl. F27d *11/02*
U.S. Cl. 219—406 **8 Claims**

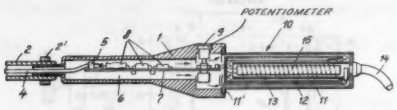


An assembly for heat shrinking a metal sleeve or tube upon a metal arbor. The assembly comprises an electrically heat oven or furnace and means for retaining a tube or sleeve in the oven during heating. The total assembly also includes means for moving the heated tube onto an arbor upon which it is to be shrunk into final position.

3,560,710
ELECTRICALLY HEATED HOT-AIR DISPENSER

Walter Fuellemann, Rorschach, Switzerland, assignor to Walter Robert Ditzler, Dornach, Switzerland, a firm of Switzerland

Filed Jan. 18, 1968, Ser. No. 698,763
Claims priority, application Switzerland, Jan. 20, 1967, 971/67
Int. Cl. H05b *1/02*; F24h *3/04*
U.S. Cl. 219—373 3 Claims

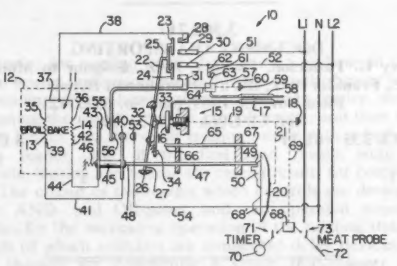


A hot-air dispenser having an elongated handle at one end of which an electric power-supply cable and a compressed-air tube are connected so that the inflowing air passes around the circuit elements and temperature-control potentiometer contained in the handle. At the other end of the handle, a series of coaxial tubes are provided, the innermost of which contains a resistive heating element and communicates with the outlet nozzle at the forward end of the heating assembly. The compressed air passes back and forth through the spaces between the tubes and from the outermost chamber inwardly. A bimetallic switch is cooled by the flow of compressed air but heats in the absence of airflow to cut off the resistive heating element when air supply is interrupted.

3,560,711
OVEN CONTROL SYSTEM AND PARTS THEREFOR OR THE LIKE

Siegfried E. Manecke, Indiana, Pa., assignor to Robertshaw Controls Company, Richmond, Va., a corporation of Delaware

Filed Jan. 13, 1966, Ser. No. 520,421
Int. Cl. F27d *11/02*
U.S. Cl. 219—413 11 Claims



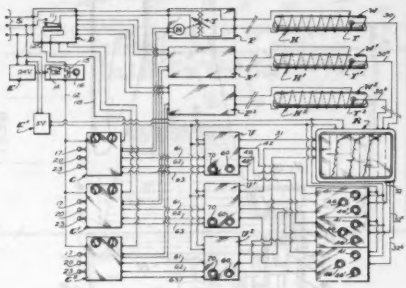
An oven control system wherein a first control means is adapted to interconnect a source of high input energy to the heating means of the oven to produce a first temperature effect of the heating means in the oven and a second control means is adapted to interconnect a source of low input energy to the heating means to produce a second temperature effect of the heating means when the first control means has been moved to a "keep warm" position whereby the low input energy maintains the oven at a noncooking and warmth retaining temperature within a narrow temperature differential range.

3,560,712
STRESS-RELIEVING APPARATUS

George G. Toohill, c/o G & G Company, P.O. Box 1477, Huntington Beach, Calif. 92647

Filed May 19, 1969, Ser. No. 825,653
Int. Cl. H05b *1/02*
U.S. Cl. 219—483 3 Claims

Apparatus for automatically controlling the flow of electric current to a plurality of electric heater units to selectively control the rate at which structure related to each heater unit is heated; to maintain the structure to be heated at a predetermined maximum temperature for a predetermined period of time and to control the rate at which the structure is cooled, said apparatus including a variable power supply

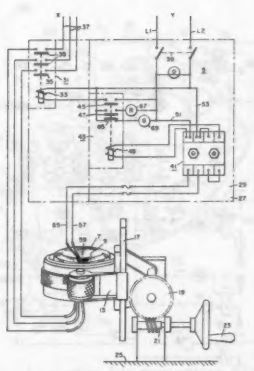


unit for each heater unit, temperature sensing means related to the structure to be heated by each heater unit and control means between the power supply unit and the temperature sensing means including a manually adjustable timed programmer and recorder and adjustable means related to the power supply units and under the control of the timed programmer.

3,560,713
ELECTRICAL THERMAL CONTROL APPARATUS AND METHOD FOR CURING INSULATION ON A WINDING

Junior Harold Troy, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Dec. 11, 1967, Ser. No. 689,462
Int. Cl. H05b *1/02*
U.S. Cl. 219—491 6 Claims



Improved electrical control apparatus is provided for curing insulation on a winding. The apparatus comprises means for automatically energizing and deenergizing a winding to maintain the temperature of the winding within a predetermined temperature range in order to cure a heat curable resinous insulating composition on the winding.

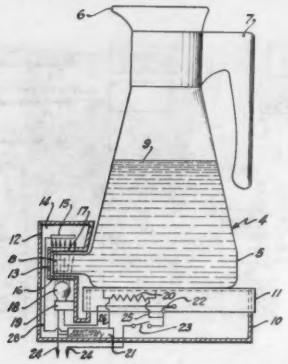
3,560,714
ELECTRICALLY HEATED COFFEE POT

Bruce A. McDonald, 1016 Middle Ave., Apt. 3, Menlo Park, Calif. 94025

Filed Aug. 8, 1968, Ser. No. 751,206
Int. Cl. H05b *1/02*
U.S. Cl. 219—502 11 Claims

This invention relates to coffee pots; more particularly, to

a coffee pot that is heated by electricity; still more particularly, to an electrically heated coffee pot whose heat is con-

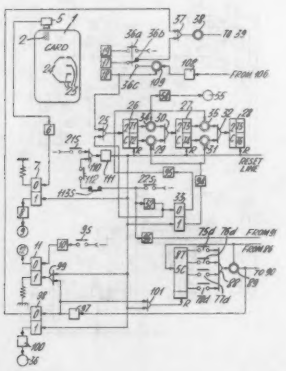


trolled by means of light passing through coffee as it is being made.

3,560,715
APPARATUS FOR CHANGING THE INFORMATION RECORDED ON CARDS

Hiroo Akamatsu, Osaka, and Masanori Nagata, Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan, a company of Japan

Filed May 29, 1967, Ser. No. 641,916
Int. Cl. G06k *5/02*
U.S. Cl. 235—61.8 **9 Claims**

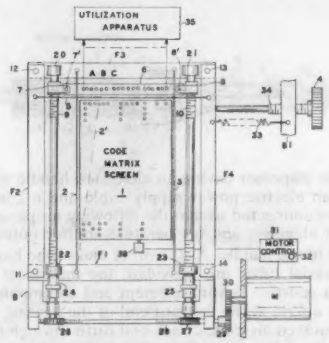


An apparatus for changing the information recorded on cards and especially the monetary value given to cards used in place of coins and/or bills in automatic vending machines and the like. The monetary value of a card as represented by code markings thereon is first read and memorized. Upon selection of an article the monetary value assigned thereto is subtracted from the memorized value read from the card. The result of the subtraction is recorded on the card for future use in place of the original monetary value recorded on the card. Dispensing of articles having a value greater than the memorized value is prevented. System and detailed circuit diagrams are provided.

3,560,716
CODE MATRIX READER FOR FILM

Robert E. White, Westbury, N.Y., assignor to OPTOmechanisms, Inc., Plainview, N.Y.

Filed Apr. 21, 1967, Ser. No. 638,176
Int. Cl. G06k *1/10*
U.S. Cl. 235—61.11 **6 Claims**

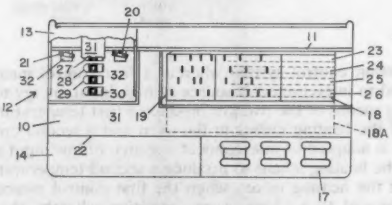


A reader for a digital code matrix carried on a film having a scanning bar with a plurality of photo detectors is mounted on a frame. The frame is rectangular in shape and pivotally connected on each corner so that it can assume the shape of a parallelogram. This is necessary since the code matrix is quite often photographically deposited on the film when it is moving or not flat so that rectangular code pattern is skewed. The scanning bar is motor driven. The photo detectors are connected to suitable utilization apparatus. A variant of this arrangement uses sensors which are fixed and the image is moved over the sensors.

3,560,717
DOCUMENT TRANSPORTING

Harvey G. Patterson, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill., a corporation of Illinois

Filed Nov. 13, 1967, Ser. No. 682,042
Int. Cl. G06k *13/07, 17/00*
U.S. Cl. 235—61.11 **8 Claims**



A cantilevered document-processing station is disposed over a document transport table. A document of any width is selectively transported under the cantilevered station for processing information with respect to the document. Canted drive rollers in the document-processing station move the document through the station and against a guide rail. A plurality of resilient document-holding fingers in the station have a dark color and a slit for improving the detecting resolution of the processing station in reading marks on the document.

3,560,718

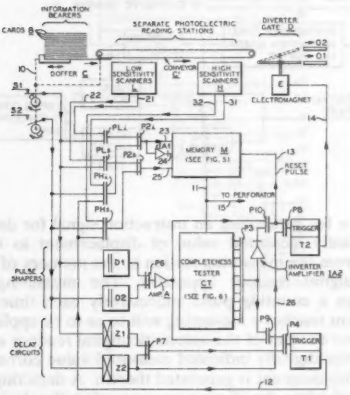
MARKED GRID READING AND TESTING DEVICE

Arie Adriaan Spanjersberg, Leiderdrop, Netherlands, assignor to De Staat Der Nederlanden, Ten Deze Vertegenwoordigd Door de Directeur-Generaal Der Posterijen Telegrafie En Telefon, Hague, Netherlands

Continuation-in-part of application Ser. No. 420990, Dec. 24, 1964, now abandoned. This application Dec. 10, 1968, Ser. No. 782,648

Int. Cl. G06k 7/00

U.S. Cl. 235—61.11 10 Claims



A device for reading marked areas on a grid on an information bearer comprising means for moving the bearer past a first reading means having a low sensitivity reader, storing and testing the results read for completeness, and then moving the bearer past a second reading means with a high sensitivity reader, and, if the first read results were not complete, storing and testing the reread results for completeness. The circuit of the reader which controls the device includes AND- and OR-gates, and cam-operated sequence switches for the successive operation of the reading stations, to each of which switches are connected delay devices and pulse shapers for controlling a single shift-register type memory or storing device and the completeness tester. This tester in turn operates separate triggers for (a) blocking the operation of the second or high sensitivity reader when the information stored in the memory or storing device has been tested to be complete as a result of the information read from the first or low sensitivity reader, and for (b) diverting the movement of the information bearer when the second or high sensitivity reader still tests the reread information to be incomplete.

3,560,719

EDGE PUNCHCARD

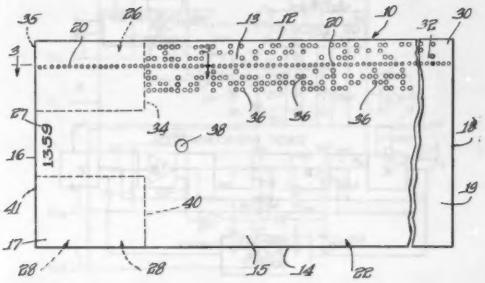
Ernest A. Dahl, Jr., Wilmette, Ill., assignor to Business Efficiency Aids Inc., Skokie, Ill., a corporation of Illinois

Filed Feb. 5, 1968, Ser. No. 702,915

Int. Cl. G06k 19/02; B65h 3/16

U.S. Cl. 235—61.12 5 Claims

An edge punch coded card of double laminated construction including between the layers thereof, at the leading edge, magnetizable metal plate members. The plate members prevent feed track holes, punched therethrough to guide the card into a machine, as well as the leading edge of the card, from becoming mutilated upon repeated entry into the machine. The plate members further serve to enable one to



magnetically separate a single card from a group of such cards.

3,560,720

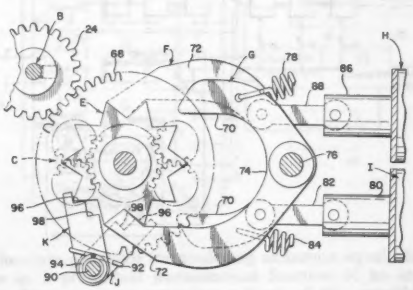
ADD-SUBTRACT COUNTER

Gentiel M. Degryse, East Moline; Frederick E. Erickson, Port Byron, and Gary D. Fredell, East Moline, Ill., assignors to Gulf & Western Industries, N.Y., a corporation of Delaware. by mesne assignment

Filed Aug. 24, 1966, Ser. No. 574,707

Int. Cl. G06m 3/12

U.S. Cl. 235—92 4 Claims



An add-subtract counter for preventing miscounts which might occur when add and subtract pulses are applied slightly out of phase to the counter, including a stop member having a plurality of stopping surfaces, each surface engaging the ratchet wheel during a different portion of the pawl stroke.

3,560,721

REVERSIBLE COUNTER

Eldon D. Vaughn, Berkeley, Calif., assignor to American Optical Corporation, Southbridge, Mass., a corporation of Delaware. by mesne assignments

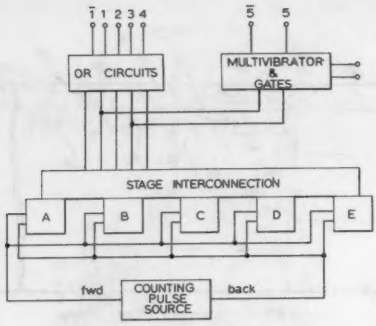
Filed Dec. 29, 1966, Ser. No. 605,675

Int. Cl. G06m 3/14

U.S. Cl. 235—92 8 Claims

A plurality of $2n + 1$ counting devices with each having forward and backward pulse inputs and interconnected so that n devices conduct while $n + 1$ are nonconducting. The

output of one of the counting devices is connected to the input of each of two additional counting devices of a binary



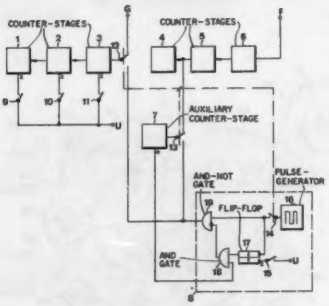
stage and through a gate controlled by one of the binary stage devices as a count output.

3,560,722

APPARATUS FOR DETERMINING AND INDICATING A DIGITAL MEASURING RESULT

Hanspeter Kuepfer, Dietikon, Switzerland, assignor to Albiswerk Zurich A.G., Zurich, Switzerland, a corporation of Switzerland

Filed Dec. 18, 1967, Ser. No. 691,615
Claims priority, application Switzerland, Jan. 19, 1967, 808/67
Int. Cl. G06m *3/08*
U.S. Cl. 235—92 **4 Claims**



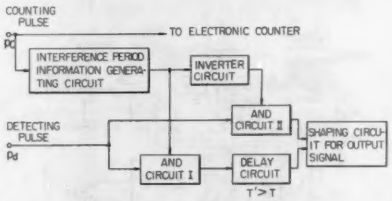
An apparatus for determining and indicating a final digital-measuring result or value obtained from a series of partial measurements. Each partial measurement can include more than one cipher or place and can be those obtained by coarse, fine, and very fine measurements. Further, one cipher or place of a coarser measurement overlaps a cipher or place of a finer measurement to thus be twice determined. The result obtained by a coarser measurement is accordingly corrected by that obtained by a finer measurement through the utilization of an auxiliary counting stage in the following manner. Initially, the coarser partial measurement storage means is preset to a value of −5 or −6 prior to measurement of the coarser value. The coarser value is then counted-in. The finer value is then counted into the finer partial measurement storage means with the value of the twice-determined or overlapping cipher or place of the finer partial measurement being also counted into the auxiliary counter stage. The difference between 10 and the value stored in the auxiliary counting stage is then fed into the coarser partial measurement storage means. In this manner, the second finest cipher or place in the coarser partial measurement storage means is corrected by normal counter transfer or carryover. The value of the finest cipher or place in the coarser partial measurement storage means is not indicated.

3,560,723

DEVICE FOR GENERATING AN INSTRUCTION SIGNAL FOR USE IN AN AUTOMATIC DIGITAL READ-OUT APPARATUS

Shin-Ichi Kamachi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1969, Ser. No. 800,935
Claims priority, application Japan, Mar. 1, 1968, 43/12870
Int. Cl. G06m *3/12*; **H03k** *21/12*
U.S. Cl. 235—92 **3 Claims**



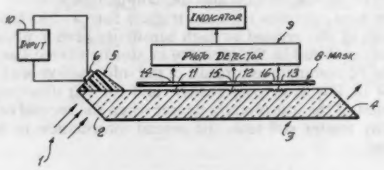
Device for generating an instruction signal for demanding the digitally measured value of displacement to be transferred from the measuring station to the memory of an automatic digital readout apparatus. The measuring station generates a counting pulse successively each time the displacement reaches a measuring unit so as to be applied to the electronic counter of the automatic digital readout apparatus so that the digitally indicated measured value corresponding to the displacement is generated therein. A detecting pulse is generated when the displacement reaches the desired measuring point thereof, and this detecting pulse is applied to the electronic counter so as to permit the digitally indicated measured value provided therein at the measuring point of the displacement to be transferred to the memory whenever the interference period of the electronic counter elapses, in which interference period the electronic counter can not provide the correct digitally indicated measured value due to the counting operation therein.

3,560,724

OPTICAL CORRELATORS

William J. Condell, Jr., Bethesda, Md., assignor to the United States of America as represented by the Secretary of the Navy

Filed Aug. 19, 1968, Ser. No. 753,371
Int. Cl. G06f *15/34*; **G06g** *7/19*; **G02b** *24/00*
U.S. Cl. 235—181 **2 Claims**



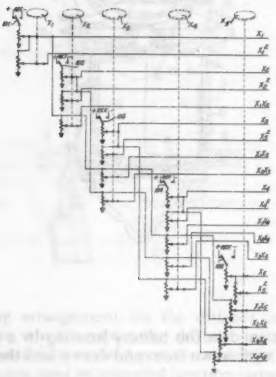
In one type of optical correlator disclosed, a Raleigh surface wave coded in accordance with electrical signal information is propagated down a solid, light-conducting member and changes the boundary surface of this member so as to permit light which is normally being propagated therethrough in a substantially total internal reflected mode to emerge therefrom and impinge on a spaced correlation mask. If the coded surface wave and the mask codings are in agreement, a maximum amount of light will leave the solid member, pass through transparent sections of the mask and arrive at a photodetector.

3,560,725

BLEND OPTIMIZER COMPRISING AN ASSEMBLY OF VARIABLE FACTOR POTENTIOMETERS

William E. Claxton, Mogadore, and Harold C. Holden, Manchester, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio, a corporation of Ohio

Filed May 16, 1968, Ser. No. 729,601
Int. Cl. G06g 7/16
U.S. Cl. 235—193 9 Claims



A special purpose analogue computer designed for optimization of the ingredient levels of a rubber compound. The physical characteristics of a particular rubber blend may be closely approximated by a general empirical model equation expressed in second order terms of the ingredients. By analysis of raw experimental data relating to the physical characteristics of interest, a different set of influence coefficients for the general equation terms may be determined for each physical characteristic, whereby a number of special model equations are obtained. In the preferred embodiment of the invention an eight channel analogue system is provided for simultaneously evaluating eight special model equations, expressed in terms of five ingredients. The set of influence coefficients for the terms of each special model equation are scaled to values less than unity and are dialed upon a separate bank of potentiometers of the analogue computer. The desired values of the ingredients are set upon five variable factor dials which may be altered to simulate various combinations of ingredients. The analogue computer then instantly computes eight outputs which represent the values the eight physical characteristics would assume for the selected blend of ingredients. A four oscilloscope read out is provided utilizing the eight outputs and is programmed so that an ideal blend results in the convergence of the four oscilloscope beams toward the center of the readout array.

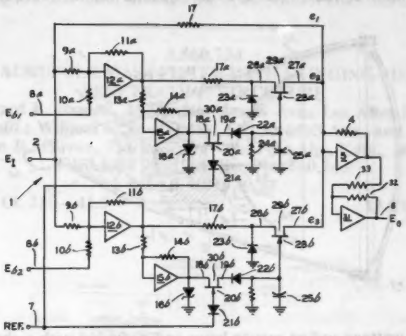
3,560,726

AC-DC FUNCTION GENERATORS USING STRAIGHT-LINE APPROXIMATION

Walter A. Platt, Fair Lawn, and Harold Moreines, Springfield, N.J., assignors to The Bendix Corporation, a corporation of Delaware

Filed Oct. 1, 1968, Ser. No. 764,246
Int. Cl. G06g 7/28
U.S. Cl. 235—197 14 Claims

An electronic circuit, for generating an AC or DC output voltage, that is an approximation of a prescribed function of an input voltage. The prescribed function being approximated by adding straight line segments, each characterized by a gating point and a slope. The segments are generated by segment generators having high gain direct coupled operational amplifiers and field effect transistors for introducing the segments at the proper gating points and series gain resistors to determine the slope of the segments. A summing amplifier adds the segments to form the prescribed function.

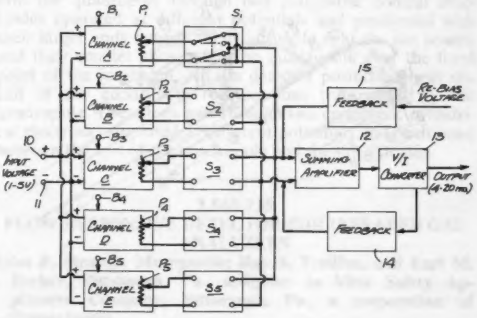


3,560,727

FUNCTION GENERATOR HAVING A MULTI-CHANNEL AMPLIFYING SYSTEM WITH EACH CHANNEL HAVING AN ADJUSTABLE SCOPE AND BREAK POINT

John E. Schussler, Trevose, Pa., assignor to Fischer & Porter Co., Warminster, Pa., a corporation of Pennsylvania

Filed Apr. 28, 1969, Ser. No. 819,810
Int. Cl. G06g 7/28
U.S. Cl. 235—197 6 Claims



A function generator for producing an output signal which varies as a prescribed mathematical function of an input signal. The generator comprises a bank of like amplifying channels whose inputs are connected in shunt relation, the input signal being applied concurrently to all channels. Each channel includes adjustable gain control means to vary the amplification slope thereof, and means to adjust the breakpoint thereof to vary the input level at which the channel is conductive. The output of each channel is fed through a separate polarity-reversing switch to a common summing amplifier whose output signal is functionally related to the input signal in accordance with the combined slopes of the amplifying channels as determined by their respective polarities.

3,560,728

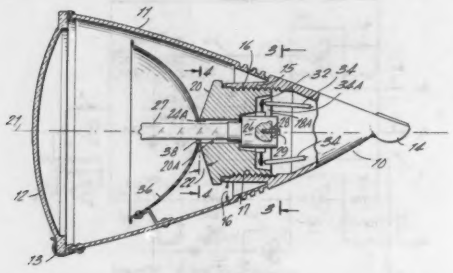
FLOODLIGHT AND HEAT DISSIPATING DEVICE

Leonard Atkin, Springfield, N.J., assignor to Stonco Electric Products Company, Kenilworth, N.J., a corporation of New Jersey

Filed Mar. 23, 1967, Ser. No. 625,440
Int. Cl. F21p 5/00
U.S. Cl. 240—3 4 Claims

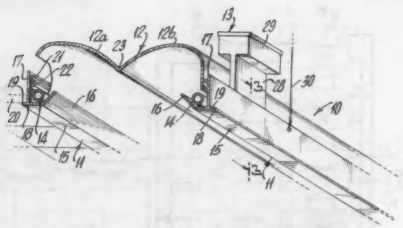
This invention is concerned with a floodlight assembly provided with an apparatus for dissipating heat from the vicinity

of a high wattage iodine quartz lamp enclosed therein; the floodlight housing being of relatively small dimensions in comparison to floodlight housings heretofore employed. The invention contemplates a mass of metal bored to receive a



high wattage iodine quartz lamp and provided with a shaped surface remote from the said lamp and means for dissipating heat from the vicinity of the said lamp by forming a heat dissipating mass adaptable to enclose the lamp without contacting it.

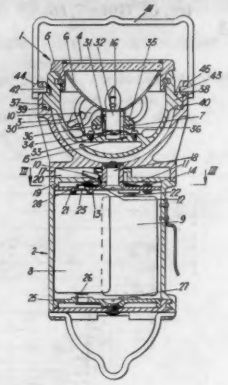
3,560,729
LIGHTING FIXTURE
Milton Liberman, 65 Seawane Road, East Rockaway, N.Y.
Filed Feb. 18, 1969, Ser. No. 800,111
Int. Cl. F21s
U.S. Cl. 240—9 **11 Claims**



A lighting fixture for mounting within a ceiling recess including a pair of spaced elongated elements having recesses containing light sources disposed therein and shielded from direct view and light-reflecting means bridging said elements to reflect the light from the lighting means downwardly, the elements and reflectors being adapted to be placed in end-to-end relationship to form a lighting fixture of any desired length and the elements further include means for supporting adjacent ceiling elements when used in connection with hung ceilings and the reflectors may be integrated with air-conditioning means and auxiliary incandescent illumination.

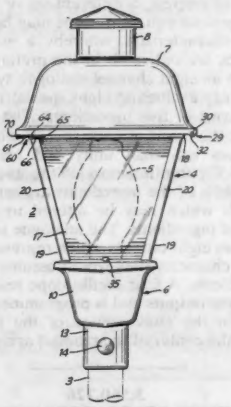
3,560,730
ELECTRIC HAND LAMP
Harold Morton, Audenshaw, Manchester, England, assignor to Oldham & Son, Limited, Manchester, England, a corporation of Great Britain
Filed June 5, 1968, Ser. No. 734,803
Claims priority, application Great Britain, June 7, 1967, 26348/67
Int. Cl. F21l *9/00*
U.S. Cl. 240—10.63 **3 Claims**

An electric handlamp comprises a headpiece which includes a shell housing a bulb holder and which is detachable from a battery housing to permit the headpiece to be used at a position remote from the battery housing. To this end the bulb holder is connected with battery connections by a cable



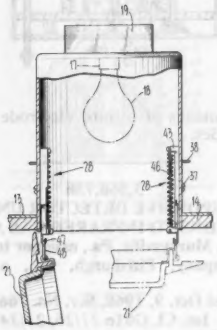
which is contained in the battery housing in a manner such that it can be withdrawn from and drawn into the housing.

3,560,731
LUMINAIRE HOUSING
James R. Burton, Franklin, Wis., assignor to McGraw-Edison Company, Milwaukee, Wis., a corporation of Delaware
Filed June 27, 1968, Ser. No. 740,618
Int. Cl. F21s *1/10;* **E05c** *19/06*
U.S. Cl. 240—11.2 **5 Claims**



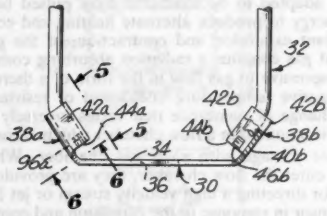
A colonial styled outdoor post top luminaire assembly including a light source housing consisting of a bottom member, a cover and an intermediate light-transmitting portion. The light-transmitting portion comprises four light-transmitting panels removably mounted in a supporting frame to form a four-sided inverted frustopyramidical light-transmitting area. The cover is hingedly fastened to the frame and releasably fastened thereto by sliding resilient latch means.

3,560,732
DIFFUSER MOUNTING ARRANGEMENT FOR LIGHTING FIXTURES
Frederic Lee Green, El Cerrito, Calif., assignor to U. S. Industries, Inc., New York, N.Y., a corporation of Delaware
Filed May 23, 1968, Ser. No. 731,603
Int. Cl. F21v *17/00*
U.S. Cl. 240—147 **8 Claims**



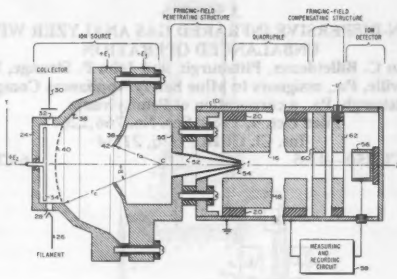
A mounting arrangement for the diffuser of a recessed lighting fixture which enables the diffuser to be selectively securely retained in a normal position closing the open end of a light housing, and an actuated position outwardly spaced from the open end of the housing wherein access to the housing interior for servicing, or the like is facilitated. The arrangement is such as to continuously support the diffuser during movement between the normal and actuated positions and to positively lock the diffuser in the actuated as well as the normal position. Inadvertent return of the diffuser from actuated to normal position is thereby prevented.

3,560,733
TAKE-APART LAMP HARP
Herman Bergman, Searingtown, N.Y., assignor to Berger Industries, Inc., Maspeth, N.Y., a corporation of New York
Filed June 17, 1968, Ser. No. 737,674
Int. Cl. F21v *17/00*
U.S. Cl. 240—148 **10 Claims**



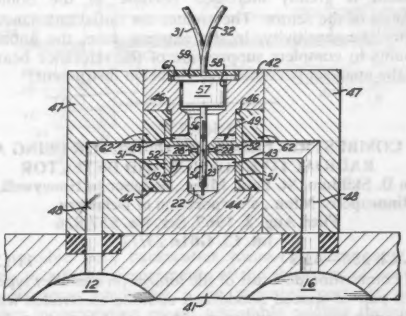
A take-apart lamp harp to be mounted on a lamp for supporting a shade thereon. The lamp harp has components which can readily be connected together and disassembled from each other. The lamp harp consists only of a bracket and a resilient bail. The bracket has a base provided with a pair of facing upwardly extending channels which flare upwardly away from one another. The channels having their interiors directed toward each other with each channel having an outer base wall extending upwardly from the base and a pair of opposed sidewalls extending inwardly from the outer base wall and respectively terminating in bottom edges which are spaced from and directed toward the base. At least one of the sidewalls of each channel is formed at its inner surface with an inner groove extending upwardly from its bottom edge, having an open bottom end, and having distant from its open bottom end an upper closed end. The resilient bail terminates in a pair of opposed elongated free end portions which flare upwardly away from one another to match the flare of the channels and are laterally movable into the channels. These free end portions of the bail are respectively provided with projections which are received in the grooves, entering into the latter through the open bottom ends thereof.

3,560,734
QUADRUPOLE MASS FILTER WITH FRINGING-FIELD PENETRATING STRUCTURE
Edward F. Barnett, 15833 Stonebrook Ave., Los Altos Hills, Calif.; William S. W. Tandler, 562 Kendall Ave., and Wilson R. Turner, 753 La Para Ave., Palo Alto, Calif. 94306
Filed June 26, 1968, Ser. No. 740,243
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 **13 Claims**



An ion source positioned near the entrance of a quadrupole mass filter focuses a beam of positive ions at a point inside the quadrupole where the defocusing effect of the fringing field is substantially reduced. This beam of ions passes into the quadrupole through two concentric conical electrodes operated at different potentials and positioned with their larger ends outside the quadrupole near the ion source and their smaller ends inside the quadrupole near the focal point of the ion beam. An ion detector positioned near the exit of the quadrupole receives ions transmitted by the quadrupole. These ions pass through two concentric cylindrical electrodes operated at different potentials and positioned between the exit of the quadrupole and the ion detector.

3,560,735
FLOW RESPONSIVE DETECTOR FOR INFRARED GAS ANALYZERS
John P. Strange, Murrysville; Ray S. Freilino, and Earl M. Becker, Pittsburgh, Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa., a corporation of Pennsylvania
Filed Oct. 9, 1968, Ser. No. 766,194
Int. Cl. G01n *21/26, 21/34*
U.S. Cl. 250—43.5 **6 Claims**



A flow responsive detector for use in an infrared gas analyzer includes a pair of gas chambers, at least one of

which is adapted to be irradiated by a pulsed beam of infrared energy to produce alternate heating and cooling, and concomitant expansion and contraction, of the gas therein when that gas contains a radiation absorbing component. A sensor responsive to gas flow in the form of a thermistor that has a negative temperature coefficient of resistance and a rate of change of resistance that varies inversely with temperature is mounted in a flow chamber, which is connected by a separate passage with each gas chamber. Where these passages enter the flow chamber, they are provided with jet orifices for directing a high velocity stream or jet flow of gas on the sensor in response to the expansion and contraction of gas in at least one of the gas chambers, thereby greatly enhancing the favorable nonlinear response characteristics of the sensor.

3,560,736

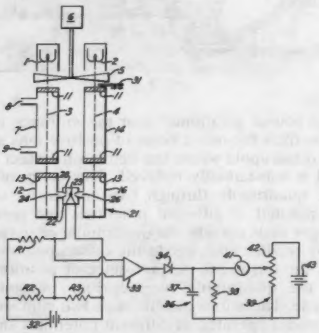
NON-DISPERSIVE INFRARED GAS ANALYZER WITH UNBALANCED OPERATION

Adrian C. Billetdeaux, Pittsburgh, and John P. Strange, Murrysville, Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Oct. 9, 1968, Ser. No. 766,226

Int. Cl. G01n *21/26, 21/34*

U.S. Cl. 250—43.5 **6 Claims**



Separate pulsed sample and reference beams of infrared energy are passed, respectively, through sample and reference gases to separate chambers in a detector unit for measuring the absorption of the sample beam by a component of interest in the sample gas. In the detector unit, the relative absorption of the two beams is measured by a flow responsive sensor in a passage connecting the two chambers, the sensor having a rate of change of resistance that varies inversely with temperature. By substantially unbalancing the two beams, in the absence of a component of interest in the sample gas, so that the sample beam is the stronger before the beams enter the detector unit, the sensitivity of the instrument is greatly increased because of the nonlinear response of the sensor. The greater the initial unbalance, the greater the sensitivity. In the extreme case, the unbalance amounts to complete suppression of the reference beam, so that the analyzer becomes a single beam instrument.

3,560,737

COMBUSTION PRODUCTS DETECTOR USING A RADIOACTIVE SOURCE AND DETECTOR

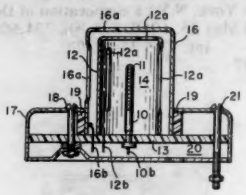
John D. Skildum, St. Paul, Minn., assignor to Honeywell, Inc., Minneapolis, Minn., a corporation of Delaware

Filed Aug. 2, 1967, Ser. No. 657,826

Int. Cl. G01n *23/12*

U.S. Cl. 250—43.5 **11 Claims**

A combustion detector of the ionization chamber type having a pair of spaced anode and cathode electrodes wherein the anode carries a radioactive source of beta particles for causing an ionization current in the interelectrode space. The electrodes are supported and positioned to provide an interelectrode space large enough to prevent most of the beta particles, emitted at the one electrode, from traversing the interelectrode space and reaching the other electrode while allowing some of the particles to do so. An electrostatic shield



is provided by means of a third electrode surrounding the first two electrodes.

3,560,738

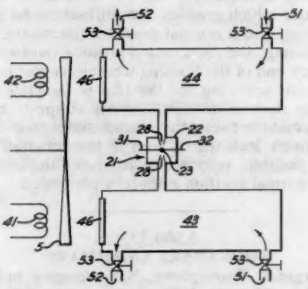
FLOW-RESPONSIVE DETECTOR UNIT AND ITS APPLICATIONS TO INFRARED GAS ANALYZERS

John P. Strange, Murrysville, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Oct. 9, 1968, Ser. No. 766,227

Int. Cl. G01n *21/26, 21/34*

U.S. Cl. 250—43.5 **18 Claims**



A flow responsive detector for use in an infrared gas analyzer includes a pair of gas chambers, at least one of which is adapted to be irradiated by a pulsed beam of infrared energy to produce alternate heating and cooling, and concomitant expansion and contraction, of the gas therein when that gas contains a radiation absorbing component. A sensor responsive to gas flow in the form of a thermistor that has a negative temperature coefficient of resistance and a rate of change of resistance that varies inversely with temperature is mounted in a flow chamber which is connected by a separate passage with each gas chamber. Where these passages enter the flow chamber, they are provided with jet orifices for directing a high velocity stream or jet flow of gas on the sensor in response to the expansion and contraction of gas in at least one of the gas chambers, thereby greatly enhancing the favorable nonlinear response characteristics of the sensor. The use of this detector unit in infrared analyzer systems permits many advantageous modifications of those systems, including the elimination of a separate sample cell.

3,560,739

PARTICLE BEAM APPARATUS FOR SELECTIVELY FORMING AN IMAGE OF A SPECIMEN OR ITS DIFFRACTION DIAGRAM

Otto Wolff, Alt-Pichelsdorf 11, 1000 Berlin 20, Germany

Filed Mar. 26, 1969, Ser. No. 810,698

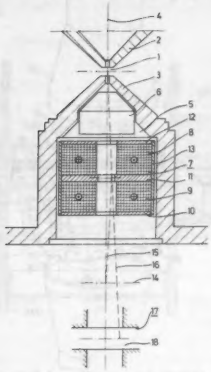
Claims priority, application Switzerland, Mar. 26, 1968, 4451/68

Int. Cl. G01n *23/04;* **H01j** *37/14;* **H01i** *37/26*

U.S. Cl. 250—49.5 **24 Claims**

Particle beam device for selectively imaging a specimen or a specimen diffraction diagram having a separately energiza-

ble electromagnetic diffraction lens located coaxially of the beam axis between the lens gap of objective lens and the projection lens. The diffraction lens is mounted in magnetically insulating relation within the bore of the objective lens which



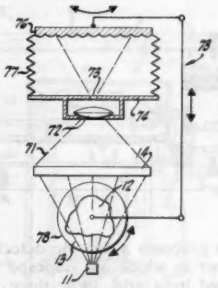
reduces the axial space of the device. The diffraction lens comprises two component lenses that develop opposing magnetic fluxes along the beam axis so that image rotations within the diffraction lens are avoided.

3,560,740

DEPTH-PERCEPTION RADIOGRAPHY

Russell Maurice Tripp, Saratoga, Calif., assignor to Tripp Research Corporation, Saratoga, Calif., a corporation of Delaware

Filed July 14, 1966, Ser. No. 565,227
Int. Cl. G01n *23/04*; H01j *37/22*
U.S. Cl. 250—61 **14 Claims**



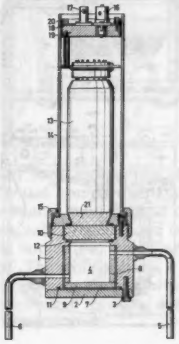
The invention described and claimed herein is a method and apparatus for producing a picture of an opaque three-dimensional subject in which the picture conveys to the unaided eyes of the observer the true spatial relationship of the internal and external elements of the subject. Specifically, the invention provides for relative rotation between a subject and the combination of a radiation source and plane transducer to produce photographic light that is scanned through a narrow aperture across a displacement grid in front of a film plane. The foregoing produces a photograph that upon direct viewing through the displacement grid conveys full internal as well as external depth perception.

3,560,741

DEVICE FOR DETECTING PRESENCE OF FISSION PRODUCTS IN THE COOLANT LIQUID OF A NUCLEAR REACTOR

Ove Magnus Strindehag, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden, a company of Sweden

Continuation of application Ser. No. 641,884, May 29, 1967. This application Nov. 8, 1968, Ser. No. 774,544
Int. Cl. G01t *1/22*
U.S. Cl. 250—71.5 **2 Claims**



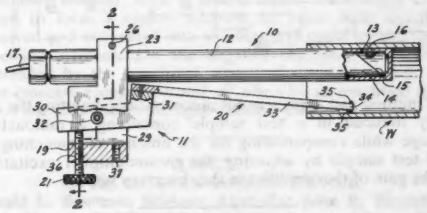
A device for measuring radioactive radiation in a liquid, comprising a measuring chamber with inlet and outlet for the liquid, and a photomultiplicator connected to the measuring chamber for the purpose of measuring the Cerenkov radiation generated in the liquid in which the walls of the measuring chamber are provided with a relatively thick layer of an optically transparent material, resulting in the energy resolution of the device being increased.

3,560,742

PORTABLE BETA BACKSCATTER MEASURING INSTRUMENT ASSEMBLY

Jacques J. Weinstock, Flushing, and William D. Hay, Peekskill, N.Y., assignors to Unit Process Assemblies, Inc., Woodside, N.Y., a corporation of New York

Filed Jan. 17, 1967, Ser. No. 609,941
Int. Cl. G01t *1/16*
U.S. Cl. 250—83 **7 Claims**



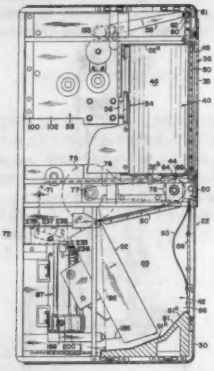
A portable beta backscatter measuring instrument assembly to effect measurements of the thickness of coatings on workpieces, including a jig mounted portable probe member incorporating means adjustable relative thereto to engage a workpiece, or an abutment fixed relative to a workpiece, to hold the probe member in firm engagement with a surface of the workpiece in proper position for measuring the thickness of a coating on the surface.

3,560,743

X-RAY FILM CHANGER HAVING A STORAGE CHAMBER WITH A WALL WHICH PIVOTS AS CASSETTES ARE FED THERETO

John W. Smit, Rexdale, and William R. Salt, Kleinburg, Ontario, Canada, assignors to Picker X-Ray Mfg., Limited, Reydale, Canada

Filed Oct. 9, 1967, Ser. No. 673,625
Int. Cl. G03b *41/16*
U.S. Cl. 250—66 **11 Claims**



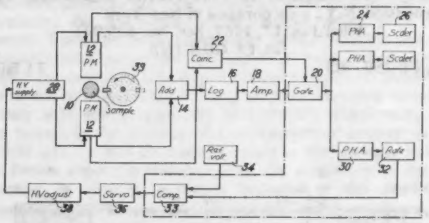
Device moving X-ray film cassettes from supply, to exposure, to exposed positions in controlled time sequence as a series of X-ray exposures are made.

3,560,744

METHOD AND APPARATUS FOR COMPENSATING OF QUENCHING IN LIQUID SCINTILLATION COUNTING

Pierre Jordan, Zurich, Switzerland, assignor to Picker Corporation, White Plains, N.Y., a corporation of New York

Continuation of application Ser. No. 563,941, June 17, 1966, now abandoned. This application June 9, 1969, Ser. No. 871,725
Int. Cl. G01n *23/10*; **G01t** *1/20*, *1/36*
U.S. Cl. 250—71.5 **20 Claims**



A method and apparatus for automatically counting the activity induced in a test sample containing a radioactive isotope while compensating for the amount of quenching in said test sample by adjusting the photomultiplier excitation or the gain of the amplifier in the detection system.

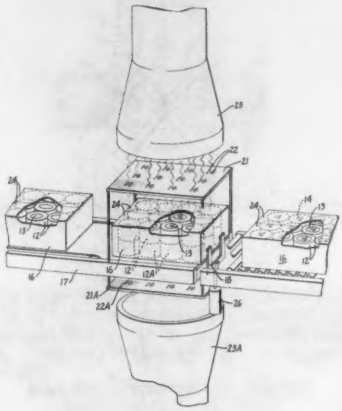
3,560,745

METHOD AND APPARATUS FOR MARKING CASED CONTAINERS BY RADIATION OF SENSITIVE EMULSIONS

Russell E. Petersen, 2607 Graceland Ave, San Carlos, Calif., and John W. Crowe, 3 Conlly Road, Huntington, N.Y. 11743

Filed Apr. 26, 1966, Ser. No. 545,458
Int. Cl. G01n *23/04*
U.S. Cl. 250—83 **4 Claims**

A radiation-sensitive emulsion is applied to an end of each container prior to packing in a shipping carton. After storage and without removing the containers from the carton, X-rays or gamma rays are passed through a shield formed with apertures to expose on the emulsion of each container desired indicia, such as price symbols. Thus canned goods may be



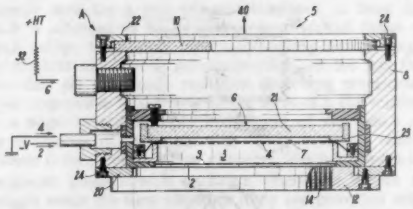
warehoused in shipping cartons and then price marked prior to shipment from the warehouse without uncasing the cans and without the necessity of the retail clerk price marking individual cans.

3,560,746

GAS-FILLED SPARK CHAMBER RADIATION DETECTOR

Alain Lansiart, Orsay; Jean Leloup, Gif-Sur-Yvette, and Jean Lequais, Orsay, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Continuation-in-part of application Ser. No. 447,675, Apr. 13, 1965, now abandoned. This application Aug. 14, 1968, Ser. No. 752,637
Int. Cl. G01t *1/16*; **H01j** *39/26*
U.S. Cl. 250—83.6 **8 Claims**



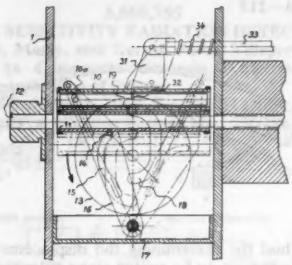
The invention proposes a particle detector comprising a gas-filled chamber in which are disposed an anode and a cathode separated by a grid, these three electrodes being parallel and the gap between the grid and the cathode being of sufficient width for the type of incident radiation. The filling gas is selected in order to ensure that a high proportion of the β radiation which constitutes the incident particles or which is induced by incident particles at the cathode and/or within said gap loses the larger part of its energy by the usual ionization process which results in the release of electrons, said detector further comprising means for establishing between the anode and the grid a potential difference which is slightly smaller than the breakdown voltage and between the cathode and the grid a voltage for collecting said electrons towards the grid-anode gap, said collection voltage being sufficiently low and the mesh of the grid being sufficiently large to ensure that only a negligible proportion of electrons is collected by the grid as said electrons pass through said grid.

3,560,747

RADIOACTIVE MATERIAL HANDLING AND STORAGE APPARATUS

Daniel Lecuyer, Domaine De Grandchamps, France, assignor to Societe A.G.S., Societe Anonyme, Paris, France

Filed Dec. 1, 1967, Ser. No. 687,346
Claims priority, application France, Dec. 20, 1966, 88,113/66
Int. Cl. G21h 5/00; G21p 5/02
U.S. Cl. 250—106 9 Claims



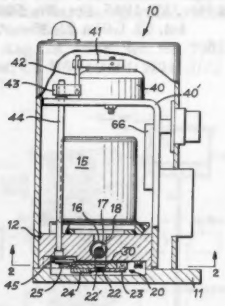
Radioactive material handling and storage apparatus, including a storage block containing a bore for receiving a holder of a source of radioactive energy. The invention is characterized by the provision of means automatically operable upon insertion of the source holder in the bore to effect insertion of a protective closure member in the bore into engagement with the source holder, whereby the holder is shielded to prevent the escape of radiation from the bore.

3,560,748

NUCLEONIC MEASURING APPARATUS WITH AUTOMATIC FIRE SAFETY RADIATION SOURCE SHUTTER CLOSING AND LOCKING MEANS RESPONSIVE TO HIGH TEMPERATURES FOR BLOCKING THE PATH OF THE SHUTTER MOVEMENT TO OPEN POSITION

Bernard W. Hatten, Columbus, Ohio, assignor to Industrial Nucleonics Corporation, a corporation of Ohio

Filed Apr. 27, 1967, Ser. No. 634,365
Int. Cl. G01t 1/17
U.S. Cl. 250—106 7 Claims



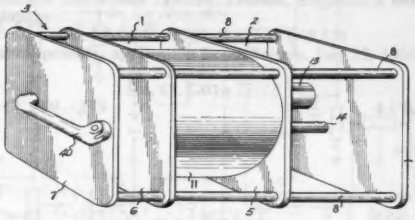
A nucleonic measuring gauge for cigarette tubing in which a housing contains a radiation source and has an aperture controlled by a sliding shutter, in which a U-shaped spring steel shutter lock is positioned in the path of shutter movement and has leaves which are held in an open position by a quantity of meltable material permitting the shutter to move between the leaves, and in which the spring leaves are stressed to close together behind the shutter blocking the shutter in a closed position upon occurrence of an abnormally high ambient temperature with the melting of the material.

3,560,749

CONTAINER MEANS FOR A RADIOACTIVE ELEMENT

Daniel Lecuyer, Le Pecq, France, assignor to Societe A.G.S., Societe Anonyme, Paris, France

Filed July 16, 1968, Ser. No. 745,211
Int. Cl. G21f 5/00
U.S. Cl. 250—108 7 Claims



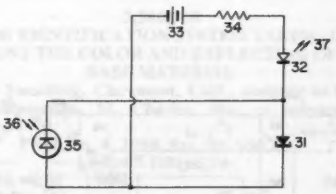
A storage container for a radioactive element, including a housing having a central compartment arranged between a pair of end compartments, said central compartment being adapted to interchangeably receive one of a plurality of different sized shielding bodies into which a radioactive element is protectively stored. The storage body is supported within a tubular housing the opposite ends of which are mounted in corresponding counterbored recesses contained in the end walls of the central compartment.

3,560,750

OPTOELECTRONIC AMPLIFIER

Minoru Nagata, Kodaira-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 30, 1967, Ser. No. 679,021
Claims priority, application Japan, Oct. 31, 1966, 41/71,372
Int. Cl. H04n 5/74
U.S. Cl. 250—199 14 Claims



An optoelectronic amplifier in which a light-receiving element, such as a photoconductive element, a light-emissive element, such as a PN junction light emitter, and a negative resistance element, such as tunnel diode, are suitably combined to form a system wherein an input light signal is received and converted into an electrical signal by the light-receiving element, and the negative resistance element is controlled by the converted electrical signal to switch the light-emissive element on and off whereby an amplified light signal is emitted from the light-emissive element.

3,560,751

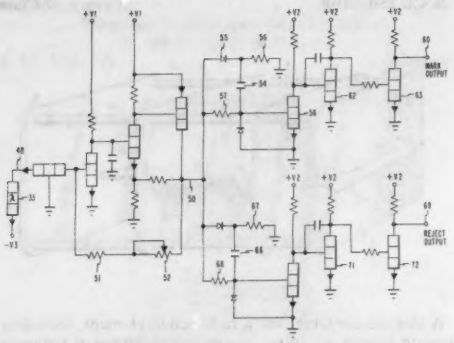
OPTICAL MARK SENSING DEVICE

Donald L. Buettner, Subiaco, Australia; John R. Burchfiel, Jr.; Norman D. Kline; Michael J. Sheehan, and Kenneth L. Thompson, Rochester, Minn., assignors to International Business Machines Corporation, Amonk, N.Y., a corporation of New York

Filed Feb. 7, 1969, Ser. No. 797,544
Int. Cl. H01j 39/12
U.S. Cl. 250—214 7 Claims

The invention pertains to an optical mark reading device which uses collinated light directed toward a document path with light reflected to and intercepted by a phototransistor array to yield signal currents. The current signal is converted to a voltage in the amplifier which is sensed by a comparator

circuit that stores a voltage level representative of background illumination and emits the signal upon the occurrence of a proportional reduction of light level indicative of a mark in the sensing area.



3,560,752

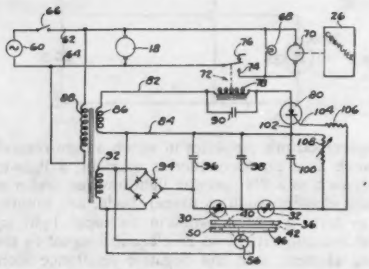
ELECTRICAL-OPTICAL MOTION DETECTOR

Yee Lee, Lexington, and Robert W. Rauth, Port Huron, Mich., assignors to The Bin-Dicator Company, Detroit, Mich., a corporation of Michigan. by mesne assignment

Original application Apr. 8, 1966, Ser. No. 541,340, now Patent No. 3,412,877, dated Nov. 19, 1968. Divided and this application Apr. 15, 1968, Ser. No. 755,473

Int. Cl. H01j *39/12*

U.S. Cl. 250—214 **10 Claims**



Motion detection apparatus wherein the rotation of a motor shaft in a material level control causes sequential energization of a pair of photocell switches via a suitable light mask carried on the shaft and at a rate related to the velocity of the shaft. A first capacitor is connected to a power supply through one of the photocell switches and a second capacitor is connected to the first capacitor by the other photocell switch. The photocell switches progressively transfer electrical energy from a power supply to the first capacitor and then to the second capacitor which serves as the input for a silicon controlled rectifier controlling energization of the motor. When the motor shaft stops rotating or deviates from a predetermined rotational velocity, the progressive energy transfer ceases to thereby stop the motor.

3,560,753

METHOD AND APPARATUS FOR DETERMINING THE DISPLACEMENT OF A CONSTRUCTION EQUIPMENT GUIDED ALONG A DESIRED COURSE BY A LASER BEAM

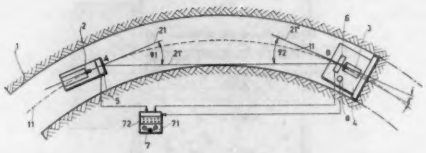
Lorenz Beug, Munich, and Rolf Maier, Grafing, Germany, assignors to Messerschmitt-Bolkow GmbH, Munich, Germany

Filed Dec. 4, 1968, Ser. No. 781,118

Claims priority, application Germany, Dec. 16, 1967, 1,658,721

Int. Cl. E21c *29/00*

U.S. Cl. 250—215 **17 Claims**



In a method for determining the displacement of a construction equipment, to be guided along a desired course by a laser beam, the laser beam is so deflected, depending upon the route to be constructed, that the respective location of the construction equipment transversely of the route is determined, in elevation and traverse, on a projection surface on the construction equipment. The laser beam is transmitted from a determined transmitting point on the route, and is received at a receiving point on the construction equipment in advance of the projection surface. The laser beam is optically deflected, relative to the desired course, at the transmitting point, and along the desired course, at the receiving point, in accordance with a set program based on the desired course and the respective location of the construction equipment. This determines any deviation of the receiving point, and thus of the construction equipment, relative to the desired course. The direction of the beam, as deflected at the receiving point, is compared with the direction of the line of action of the construction equipment to determine any angular deviation of the line of action relative to the desired course.

3,560,754

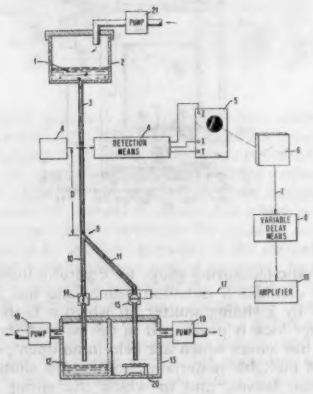
PHOTOELECTRIC PARTICLE SEPARATOR USING TIME DELAY

Louis A. Kamentsky, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed Nov. 17, 1965, Ser. No. 508,307

Int. Cl. G01n *21/26*

U.S. Cl. 250—218 **19 Claims**



This disclosure relates to apparatus for discriminating between cancer and normal cells by measuring the absorp-

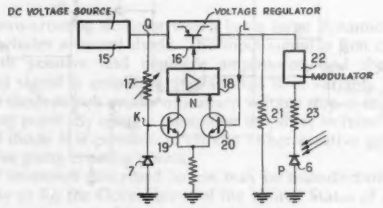
tion by nucleic acids per unit volume of each cell in a sample and separating the cancer cells from the sample by shunting the cancer cells from a main flow channel into a shunting junction. Upon being presented at the junction, after a suitable delay, a force is applied at the junction to the cancer cell and the cell is passed into the shunting junction for subsequent collection. The force applied to the cell may be hydraulic, pneumatic, electrostatic or some combination of these forces.

3,560,755

HIGH SENSITIVITY RADIATION DETECTOR

Roger Blaise, Massy, and Gerard Peres, Villepreux, France, assignors to Campagnie Generale D'Electricite, Paris, France, a corporation of France

Filed Apr. 1, 1969, Ser. No. 812,169
Claims priority, application France, Mar. 29, 1968, 146,583
Int. Cl. H01l *15/00*
U.S. Cl. 250—214 **15 Claims**



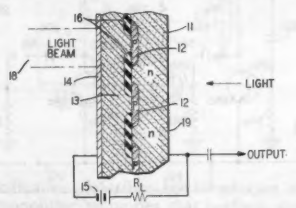
A photodetector diode operating with avalanche characteristics is energized through a regulator which, when the temperature of this diode varies, compensates for this variation by acting upon the energizing voltage to the diode. A reference diode having electrical characteristics equivalent to those of the detector diode and being thermally coupled to this detector diode furnishes for this purpose a reference signal to which the energizing voltage of the detector diode is coordinated by means of a differential amplifier and by means of the regulator.

3,560,756

OPTICAL STORAGE DEVICE WITH SOLID STATE LIGHT ACTUATED SCANNING MEANS FOR SOLID STATE OUTPUT MEANS

Edward F. Labuda, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed Aug. 28, 1968, Ser. No. 755,990
Int. Cl. H04n *3/14*; **H01l** *3/12*
U.S. Cl. 250—217 **5 Claims**



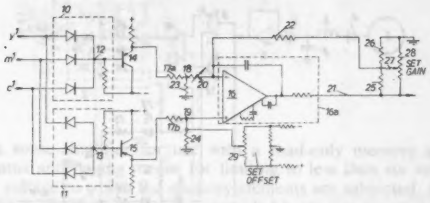
One surface of the target of a television camera device is scanned by a light beam, with light to be recorded being imaged on the opposite surface. The target comprises a substrate having a diode array on one side with a photoconductive layer being sandwiched between a transparent conductive film and the diode array. A voltage on the conductive film reverse biases the diodes. During one frame time, the diodes discharge as a function of light intensity imaged on the substrate. The scanning light beam recharges the diodes by increasing the localized conductivity of the photoconductive layer, and thus generates a video signal output.

3,560,757

CIRCUIT FOR GENERATING BLACK-PRINTER SIGNAL IN COLOR PRINTING APPARATUS

Peter C. Pugsley, Pinner, Middlesex, England, assignor to Crosfield Electronics Limited, London, England, a British company

Filed July 18, 1969, Ser. No. 843,131
Claims priority, application Great Britain, July 22, 1968, 34792/68
Int. Cl. G01n *21/18*
U.S. Cl. 250—219 **4 Claims**



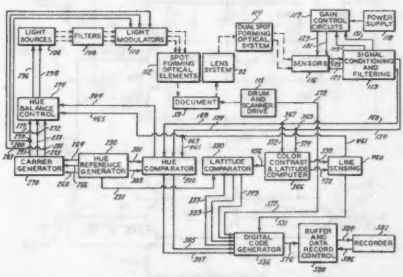
In color printing, a circuit for generating a black printer signal has means for varying a selectivity factor which permits adjustment of the amount of black in colored areas while leaving it substantially unchanged in neutral areas. This variation is accomplished without substantial alteration of the scale factor of the black printer signal. The circuit includes maximum and minimum signal selector circuits receiving the color component signals and supplying the maximum and minimum signals to the two inputs of a differential amplifier having a feedback path to a first of the two inputs. The selectivity factor depends on the ratio of resistances in the feedback path and in the first input path.

3,560,758

COLOR IDENTIFICATION SYSTEM TAKING INTO ACCOUNT THE COLOR AND REFLECTING OF THE BASE MATERIAL

Melvin E. Swanberg, Claremont, Calif., assignor to Conductron Corporation, St. Charles, Mo., a corporation of Delaware

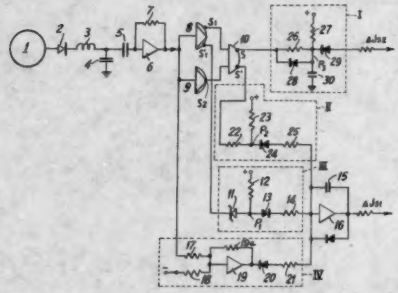
Filed Jan. 8, 1968, Ser. No. 696,409
Int. Cl. G01j *3/34*
U.S. Cl. 250—226 **34 Claims**



The color identification system takes the color and the reflectivity of the base material of a printed or drawn colored document into account as it identifies the pigments which define the various differently colored areas of that document, and thus is a relative color identification system; and that color identification system can accurately identify the pigments which define the various differently-colored areas on that document by classification of each color, which is de-

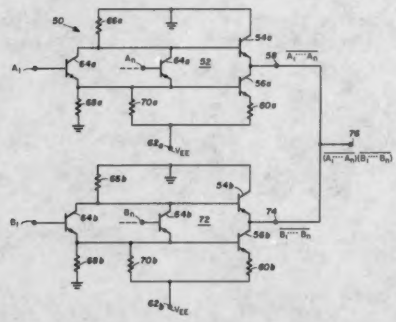
tected, as being within a range of colors, which includes all colors that can be expected to result from one pigment.

3,560,759
WHEEL SLIP PROTECTION DEVICE
Hansrudi Buehler, Ciona Di Carona; Alfred Ernst, and Beat Steiner, Zurich, Switzerland, assignors to Maschinenfabrik Oerlikon, Zurich, Switzerland
Filed Nov. 22, 1967, Ser. No. 685,104
Claims priority, application Switzerland, Nov. 24, 1966, 17,014/66
Int. Cl. B61c *15/12*
U.S. Cl. 290—17 **10 Claims**



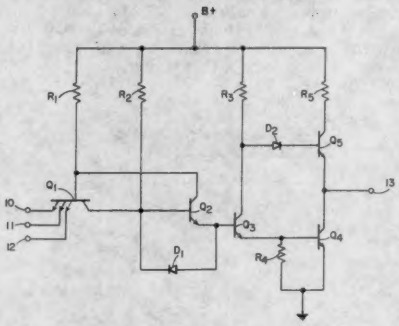
A device for protecting against slipping of a drive or traction wheel includes means deriving a first traction reduction component which is largely variable during slipping of a traction wheel, and additional means deriving a second traction reduction component which is nearly constant during slipping of a traction wheel. These components are combined to control the current of a driving motor to reduce the slipping of the traction wheel to zero.

3,560,760
LOGIC NAND GATE CIRCUITS
David H. Chung, and Bill H. Terrell, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex., a corporation of Delaware
Continuation of application Ser. No. 602,805, Dec. 19, 1966, now abandoned. This application Feb. 2, 1970, Ser. No. 7,356
Int. Cl. H03k *19/36*
U.S. Cl. 307—215 **6 Claims**



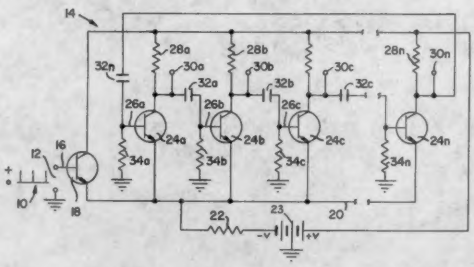
Disclosed are logic NAND gate circuits of the type capable of driving a low impedance or a high capacitance load while maintaining relatively fast propagation speed which include a pair of output transistors of one type respectively connected to bias voltage supplies and connected in common to an output circuit, and a plurality of input transistors connected between the bases of the output transistors. A logic 1 input signal at any one of the input transistors produces a logic 0 output signal.

3,560,761
TRANSISTOR LOGIC CIRCUIT
John J. Kardash, Acton, Mass., assignor to Sylvania Electric Products Inc., a corporation of Delaware
Filed July 25, 1968, Ser. No. 747,537
Int. Cl. H03k *19/34*
U.S. Cl. 307—215 **3 Claims**



A transistor-transistor NAND logic circuit including a switching transistor between the input transistor and the final transistor at the output of the circuit. The switching transistor is regeneratively coupled to the input transistor and arranged so as to establish relatively high noise margins which must be exceeded by signals at the input connections to the input transistor in order to change the operating state of the circuit.

3,560,762
RING COUNTER
Frederik Nordling, Sausalito, Calif., assignor to Lynch Communications Systems, Inc., San Francisco, Calif., a corporation of Delaware
Filed Feb. 12, 1968, Ser. No. 707,915
Int. Cl. H03k *23/22*
U.S. Cl. 307—223 **1 Claim**



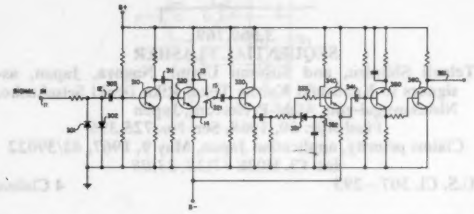
This ring counter uses the emitters of the counting stage transistors as the drive signal input. Consequently, the counter is simple in construction and can be easily switched by current interruptions; is self-stabilizing to avoid spurious counting modes; and requires power for only one stage regardless of the number of stages in the ring.

3,560,763

ZERO-CROSSING DETECTOR

Francis X. Downey, Annandale, and Alick H. Frank, Springfield, Va., assignors to the United States of America as represented by the Secretary of the Navy

Filed Nov. 29, 1967, Ser. No. 686,400
Int. Cl. H03k 5/20
U.S. Cl. 307—235 1 Claim



A zero-crossing detector which has a large dynamic range and includes a tunnel diode. The input signal is first clipped in both positive and negative amplitudes, and then the clipped signal is amplified and applied to a variably biased tunnel diode which produces a sharp voltage step at the zero-crossing point. By using a paraphase amplifier in front of the tunnel diode it is possible to choose either positive going or negative going crossing points.

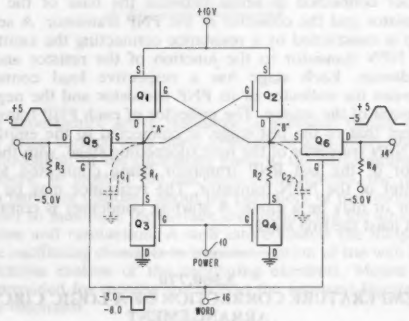
The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

3,560,764

PULSE-POWERED DATA STORAGE CELL

Joseph J. McDowell, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Continuation of application Ser. No. 641,223, May 25, 1967, now abandoned. This application Mar. 2, 1970, Ser. No. 14,787
Int. Cl. H03k 3/286
U.S. Cl. 307—238 10 Claims



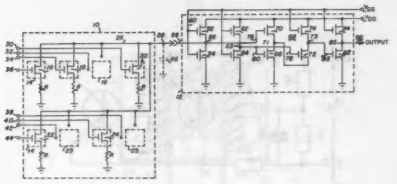
This specification describes semiconductor storage cells for use in monolithic memories that perform storage and/or associative storage functions. These cells each comprise a pair of semiconductor devices which are coupled together to form a bistable circuit. The loads for the bistable circuits are other semiconductor devices which can be biased to regulate current drawn by the bistable circuit from a source for powering the bistable circuit. These current-regulating semiconductor devices are gated on and off to intermittently power the bistable circuit. During the periods in which power is gated-off, the bistable circuit is maintained in the proper operating state by charge stored in the elements of the bistable circuit.

3,560,765

HIGH SPEED MOS READ-ONLY MEMORY

James J. Kubinec, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif., a corporation of Delaware

Filed Dec. 4, 1968, Ser. No. 781,017
Int. Cl. H03k 17/60
U.S. Cl. 307—246 12 Claims



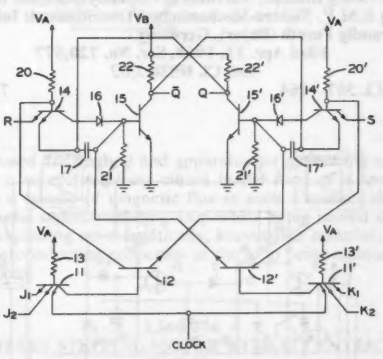
A sense-amplifier for use with a read-only memory apparatus and having means for limiting to less than six volts the voltage to which the memory elements are subjected. An all FET amplifier structure is provided having an input stage which clamps the output voltage of the memory device to a predetermined potential and prevents the output of the memory from causing this potential to swing more than a predetermined value when a storage element is gated ON. The amplifier of the present invention has an input impedance which is at least 20 times smaller than similar prior art devices and thus enables a 20 to 1 or better reduction in the time constant associated with the data readout operation. As a result, substantially higher readout speeds can be obtained.

3,560,766

HIGH SPEED LOGIC ELEMENT

James O. Moore, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass., a corporation of Massachusetts

Filed Jan. 21, 1969, Ser. No. 792,461
Int. Cl. H03k 3/26
U.S. Cl. 307—291 5 Claims

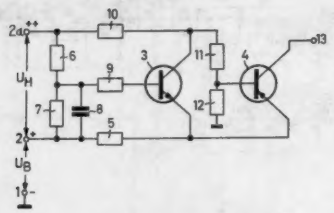


A JK flip-flop circuit is provided which has been optimized for high counting or toggle rates and low differential delay. A unique bilateral triggering circuit is used to steer current between node pairs rather than unilaterally from a single node thereby eliminating multigate feedback paths which retard counting or toggle rates and increase differential delay.

3,560,767
DELAY CIRCUIT ARRANGEMENT

Karl Traub, Furth, Bayern, Germany, assignor to Grundig Elektro-Mechanische Versuchsanstalt INH Max Grundig, Furth, Bayern, Kurgartenstrasse, Germany

Filed Mar. 19, 1969, Ser. No. 808,446
Claims priority, application Germany, Mar. 23, 1968, P 17 66 026.3
Int. Cl. H03k *17/26*
U.S. Cl. 307—293 12 Claims

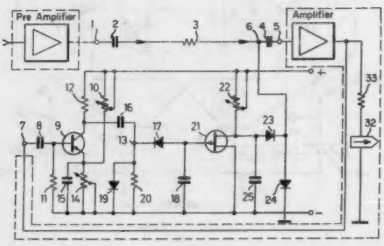


An arrangement for delaying the application of a voltage supply for a predetermined time interval. An auxiliary voltage supply of identical polarity and with one terminal at a level exceeding the level of the terminal which is common to the supplies, is applied across a voltage divider. A first transistor is connected to a tap or junction of the voltage divider through its base. The emitter-collector path of this first transistor is connected across the voltage divider and the auxiliary power supply. A second transistor of opposite conductivity type relative to the first transitor is connected with its emitter to the terminal common to the two power supplies, as well as the emitter of the first transistor. The base of the second transistor is connected to a second voltage divider connected to the collector of the first transistor. Through a capacitor connected in parallel with a portion of the first voltage divider connected across the auxiliary power supply, an RC network is realized which delays the application of the voltage appearing at the collector of the second transistor, for a selected predetermined time interval.

3,560,768
CONTROL CIRCUIT FOR A LOW-FREQUENCY AMPLIFIER

Hans-Georg Rimkus, Nurenberg, Germany, Assignor to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inh., Max Grundig Fuerth (Bayer), Germany

Filed Apr. 11, 1968, Ser. No. 720,577
Int. Cl. H03b *3/02*
U.S. Cl. 307—264 7 Claims



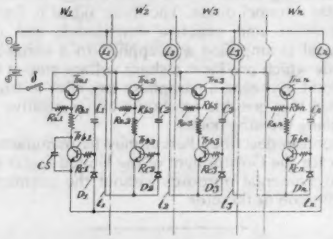
A low-frequency input voltage is fed to a voltage divider consisting of a fixed resistor and a pair of diodes connected in parallel but with opposite polarity with respect to AC but series-connected with respect to DC. The output voltage is derived from the DC common point of the two diodes and is thus a function of the impedance of said diodes. The impedance of the diodes is controlled as follows:

A voltage proportional to the input voltage, after passing a threshold stage, is used to charge a capacitor. The capacitor circuit has a short charging time and a long discharge time. The capacitor voltage constitutes the voltage at the gate of a field effect transistor, the voltage at whose drain electrode is used to control the impedance of the diodes. A circuit for compensating for temperature effects on the impedance of the diodes by inserting a DC voltage in the diode circuit is also shown.

3,560,769
SEQUENTIAL FLASHER

Tetsuji Shimizu, and Susumu Usami, Nagoya, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Aichi-Prefecture, Japan

Filed Apr. 30, 1968, Ser. No. 725,396
Claims priority, application Japan, May 9, 1967, 42/39022
Int. Cl. H03k *17/28, 23/08*
U.S. Cl. 307—293 4 Claims



A sequential flasher includes a plurality of successive stages connected in cascade and each including a PNP transistor, having its emitter connected to the positive terminal of a source of potential, and an NPN transistor. Each stage includes a first loop constituted by the emitter of the PNP transistor, a resistor connecting the base thereof to the collector of the NPN transistor, and a resistor and a condenser connected in series between the base of the NPN transistor and the collector of the PNP transistor. A second loop is constituted by a resistance connecting the emitter of the NPN transistor to the junction of the resistor and the condenser. Each stage has a respective load connected between the collector of its PNP transistor and the negative terminal of the source. The collector of each PNP transistor, except that of the last stage, is connected to the emitter of the NPN transistor of the next succeeding stage, with the collector of the last PNP transistor being connected to the emitter of the NPN transistor. The resistance may be a resistor or may be a diode. A starting condenser is connected in at least the first stage.

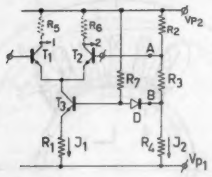
3,560,770
TEMPERATURE CORRECTION OF A LOGIC CIRCUIT ARRANGEMENT

Joannes Paulus Maria Gieles, Emmasingel, Eindhoven, Netherlands, assignors by mesne assignment to U.S. Philips Corporation, New York, N.Y., a corporation of Delaware

Filed Dec. 27, 1967, Ser. No. 693,945
Claims priority, application Netherlands, Jan. 5, 1967, 6700144
Int. Cl. H03f *1/30*
U.S. Cl. 307—310 3 Claims

A temperature compensated logic circuit having two transistors with commonly connected emitters and a third transistor, the collector-emitter path of which connects the emitters of the two transistors through a resistance to one terminal of a two terminal source of supply. A voltage divider having two taps is connected between the terminals, one tap being connected to the base electrode of one of the two emitter-connected transistors. The temperature compensa-

tion is through a barrier layer connecting the base electrode of the third transistor to the other divider tap, while a resistance further connects the base electrode of the third transistor to the other supply terminal.



3,560,771

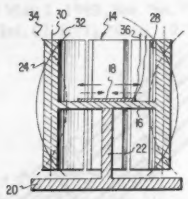
ACOUSTICALLY ACTIVE RESONATOR

Hugh M. Baker, Jr., Washington, D.C., assignor to HB Engineering Corporation, Montgomery County, Md., a corporation of Maryland

Continuation-in-part of application Ser. No. 714,221, Mar. 19, 1968, now Patent No. 3,453,462. This application May 7, 1969, Ser. No. 822,639

Int. Cl. H04r *17/00*

U.S. Cl. 310—8.2 **15 Claims**



An acoustically active resonator is provided having relatively large surface area parts in order to efficiently couple the movement of the oscillating parts to the surrounding atmosphere. In most of the disclosed embodiments, the oscillating parts are disposed about the periphery of the resonator in order to maximize the surface area producing the air compression and rarefaction. A web interconnects the midpoint of the oscillating elements to transmit motion of the web into predictable motion of the oscillating elements. Means are also provided for moving the web at the resonant frequency of the resonator.

3,560,772

PIEZOELECTRIC CRYSTAL MOUNTING EMPLOYING RESILIENT PARTIALLY CONDUCTIVE SUPPORT PADS

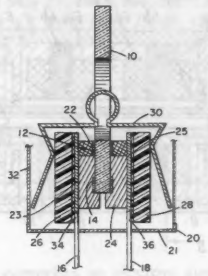
Antonio Lungo, Middleburg Heights, and Gordon J. Conley, Macedonia, Ohio, assignors to Clevite Corporation, a corporation of Ohio

Filed Sept. 9, 1969, Ser. No. 856,265

Int. Cl. H01v *7/00*

U.S. Cl. 310—9.4 **5 Claims**

There is provided a novel mounting means for a piezoelectric resonator within a filter assembly, said mounting means comprise a conductor backing support on both sides of the resonator element connected thereto by means of wedge-shaped resilient pads secured on said conductor backing each pad having a first conductive part resting on the electrode means of said resonator to effect electrical contact, and a second nonconductive part for support, thereby minimizing spurious and mechanical resonances, variations in bandwidths, and insertion losses.



3,560,773

SUPERCONDUCTING DYNAMOELECTRIC MACHINE

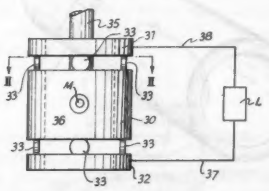
Ian Duncan McFarlane, Lancaster, England, assignor to National Research Development Corporation, a corporation of Great Britain

Filed June 14, 1967, Ser. No. 645,919

Claims priority, application Great Britain, June 16, 1966, 26,819/66

Int. Cl. H02k *9/10*

U.S. Cl. 310—10 **6 Claims**



Disclosed are method and apparatus for generating a current in a superconducting circuit in the form of a loop by moving a bundle of magnetic flux in such a manner that it threads the superconducting loop while being moved in regions containing no magnetically, irreversible material, with the superconducting properties of the loop being maintained throughout.

3,560,774

ROTARY STEPPING MOTOR WITH ECCENTRIC ROTOR

Raymond R. Reeves, 33 Grove Park, London, SE. 5, England

Filed Dec. 16, 1968, Ser. No. 783,789

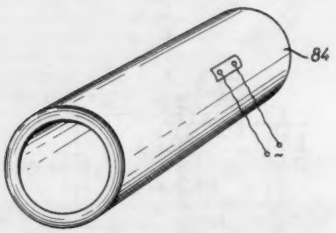
Int. Cl. H02k *29/02, 37/00*

U.S. Cl. 310—49 **17 Claims**

An electric stepping motor comprising a stator with three or more circumferentially displaced poles and provided with a rotor (inside or outside) which is arranged to transmit angular drive in discrete steps, the rotor moving eccentrically in relation to the axis of the stator. Both the rotor and stator may carry cooperating gears. Permanent magnet detents are

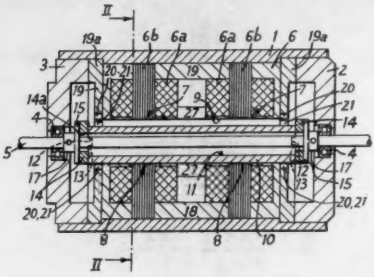
provided on the stator. The drive coupling may be a slide arrangement, a flexible bellows, or an eccentric cam. The control circuitry includes a pulsing arrangement, ring counter, inductive pickoffs, and a coincidence detector.

3,560,775
ROTARY MAGNETOELECTRIC DEVICE
Otto Welter, Orselina-Logarno, Switzerland, assignor to Elektro-Motoren A.G., Zug, Switzerland
Filed Mar. 10, 1966, Ser. No. 533,329
Claims priority, application Germany, Mar. 10, 1965, E28,846
Int. Cl. H02k *21/10*
U.S. Cl. 310—126 **17 Claims**

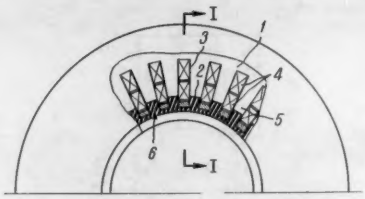


A rotary magnetoelectric device of small diameter and great length having a stator assembly comprising at least two pairs of U-shaped members. The outer legs of the U-shaped members are in abutment whereas the inner legs are spaced to provide a central air gap, thus forming at least two pairs of stator poles. A cylindrical permanent magnet rotor is disposed between the stator poles. A cylindrical coil provides an alternating field to the stator poles.

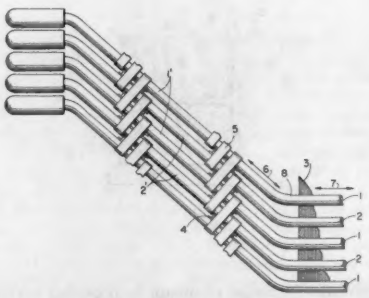
3,560,776
SLOT CLOSERS FOR AN ELECTRICAL MACHINE
Vasily Semenovich Kildishev, Ulitsa Plekhanovskaya, 41/43, kv. 55, and Vadim Borisovich Kaplunov, Ulitsa Bairona, 140/34, kv. 45, Kharkov, U.S.S.R.
Filed Apr. 25, 1969, Ser. No. 819,152
Int. Cl. H02k *3/48*
U.S. Cl. 310—214 **5 Claims**



A stator for an electrical machine is composed of a core with slots containing winding bars completely filling the entire spaces of the core slots and projecting therefrom into slots formed in an insulating cylinder accommodated within the bore of the core. Rigid connectors such as wedges are interposed between the cylinder and the winding bars for securing the bars in the slots. The cylinder may be constituted by a plurality of separate rings in which case separate wedges are employed for each ring in each of the slots thereof.



3,560,777
ELECTRIC MOTOR COIL BANDAGE
Werner Moeller, Dubendorf, and Walter Dreher, Hegnau, Switzerland, assignors to Maschinenfabrik Oerlikon, Zurich, Switzerland
Filed Aug. 12, 1969, Ser. No. 849,424
Claims priority, application Switzerland, Aug. 19, 1968, 12580/68
Int. Cl. H02k *3/46*
U.S. Cl. 310—270 **11 Claims**

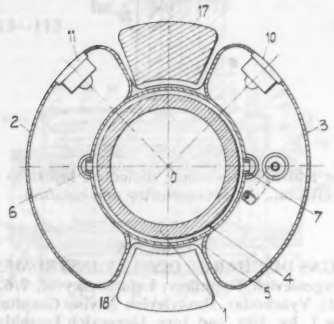


An electric motor coil bandage has at least two or more independent coil legs of a rotor or a stator each having a face connection which includes a coil rod connected to the individual coil leg. A bandage extends around a plurality of sets of the coil rods of identical coils and a rubber elastic compressible cushion is disposed between adjacent rods and is adapted to glide relatively to the insulation surface of these rods.

3,560,778
COOLING SYSTEM FOR AN ELECTRON TUBE RELEASED ON A TRAJECTORY
Auguste H. Raye, Paris, France, assignor to CSF-Compagnie Generale De Telegraphie Sans Fil, a corporation of France
Filed July 5, 1968, Ser. No. 742,943
Claims priority, application France, July 10, 1967, 113,737
Int. Cl. H01j *7/28, 61/52*
U.S. Cl. 313—18 **2 Claims**

A cooling device for electron tubes, exploiting the vaporization of a liquid contained in sealed tanks, surround-

ing the tube anode. The vaporization of the liquid is controlled by a valve associated with the tanks. The blowoff



pressure of this valve is equal to the vaporization pressure at the selected temperature of operation.

3,560,779

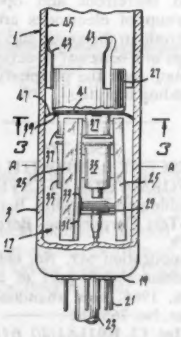
SHADOW MASK TYPE COLOR PICTURE TUBE WITH A FINE MESH FLEXIBLE PARTICLE SHIELD BETWEEN THE GUN AND TARGET PORTIONS

Homer L. May, Lancaster, Pa., assignor to RCA Corporation, a corporation of Delaware

Filed May 2, 1968, Ser. No. 726,143

Int. Cl. H01j *29/50, 19/50*

U.S. Cl. 313—70 **1 Claim**



A shadow-mask-type color picture tube, comprising a glass envelope including neck, funnel and target portions, a triple-beam electron gun structure mounted in the neck portion, a mosaic three-color phosphor screen on the inner wall of the target portion, and a multiapertured shadow mask mounted adjacent to the screen, is provided with a fine mesh flexible annular particle shield, e.g. of stainless steel mesh, attached to the gun and extending into continuous contact with the wall of the neck portion.

3,560,780

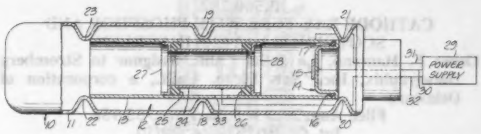
VACUUM TUBE WITH COAXIAL ASSEMBLY OF ELECTROSTATIC FOCUSING MEANS AND ELECTRON GUN MOUNT

Johann B. Beeli, Sylmar, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y., a corporation of Delaware

Filed May 27, 1968, Ser. No. 732,218

Int. Cl. H01j *1/88, 19/46, 31/00*

U.S. Cl. 313—82 **1 Claim**



The invention comprises an electron gun having an outer cylindrical tube, inside of which a shorter cylindrical tube is positioned. The inner tube is maintained at a different direct-current potential than the outer tube. The inner tube is positioned inside the outer tube spaced from the ends of the outer tube. Symmetrical electron lenses are then produced at the ends of the inner tube. The use of the outer tube as a mechanical support for the inner tube makes the construction mechanically strong, yet inexpensive.

3,560,781

CORPUSCULAR BEAM MICROSCOPE APPARATUS

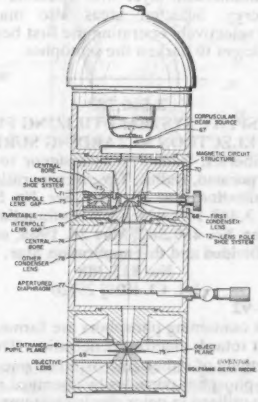
Wolfgang Dieter Riecke, Berlin, Germany, assignor to Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften e.V., Gottingen, Germany, a corporation of Germany

Filed July 27, 1967, Ser. No. 656,400

Claims priority, application Germany, Feb. 24, 1967, M72885

Int. Cl. H01j *29/46, 37/16*

U.S. Cl. 313—84 **17 Claims**



The beam condenser located in an electron or ion microscope between the beam source and the objective lens comprises at least two lenses, namely a first condenser lens which produces a reduced image of the beam source, and a last condenser lens which produces a reduced image of an aperture diaphragm upon the object plane defined by the objective lens. Within such an arrangement, the first condenser lens comprises a plurality of lens pole shoe systems that can be selectively placed into active position of axial alignment with the beam source and the objective lens. The pole shoe systems have respectively different imaging lengths but have the diameter of their lens bore as well as the width and axial

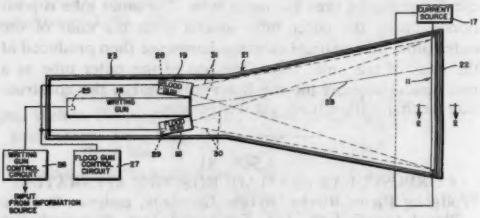
position of their lens gap, so adapted to one another as to maintain an invariable axial position of the source image produced by the first condenser lens, regardless of which one of the pole shoe systems is placed into active position at a time. This affords selecting different radiation (illumination) apertures for one and the same illuminated area of the object without the necessity of changing the focal lengths of the other lenses; and it permits adjusting the size of the illuminated area of the object independently of the magnitude of the illumination aperture of the object.

3,560,782

CATHODE RAY TUBE WITH PHOSPHOR AND SCOTOPHOR LAYERS IN SCREEN

Omer F. Hamann, La Jolla, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif., a corporation of Delaware

Filed Aug. 28, 1968, Ser. No. 755,956
Int. Cl. H01j *29/14, 29/50*
U.S. Cl. 313—91 **12 Claims**



A cathode ray tube is described comprising a target screen including a transparent conductive layer, a scotophor layer, and a luminescent layer. A first electron beam is directed at the target screen with sufficient energy to darken preselected areas of the scotophor layer. Such areas are made visible by flooding the luminescent layer with a second electron beam of lower energy. Selected areas also may be further brightened by selectively operating the first beam at an energy level insufficient to darken the scotophor.

3,560,783

COLOR DISPLAY SYSTEM UTILIZING PHOSPHORS HAVING AN ELECTRON RETARDING SURFACE LAYER

Samuel Ray Shortes, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex., a corporation of Delaware

Original application June 30, 1966, Ser. No. 561,815, now Patent No. 3,449,148, which is a continuation-in-part of application Ser. No. 459,582, May 28, 1965, now Patent No. 3,408,223. Divided and this application Mar. 3, 1969, Ser. No. 813,388
Int. Cl. H01j *29/20*
U.S. Cl. 313—92 **2 Claims**

Zinc sulfide containing phosphors are formed having a surface layer that retards electron penetration. The surface layer consists essentially of either zinc oxide or zinc sulfide formed in situ on the phosphor particles by chemical reaction. These phosphors are utilized in color display systems.

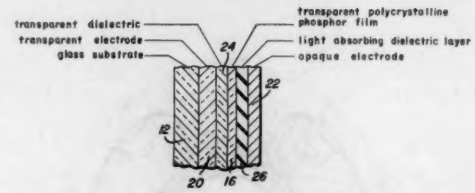
3,560,784

DARK FIELD, HIGH CONTRAST LIGHT EMITTING DISPLAY

Gordon N. Steele, Santa Barbara, and Edwin J. Soxman, Golela, Calif., assignors to Sigmatron, Inc., a corporation of California

Filed July 26, 1968, Ser. No. 748,046
Int. Cl. H01j *29/18, 29/28*
U.S. Cl. 313—92 **13 Claims**

A light-emitting phosphor display device having a high contrast ratio is provided having a light-absorbing dielectric layer on the side of the phosphor layer opposite the viewing side to absorb the incident ambient light. Polycrystalline layers with matching refractive indices are selected for the



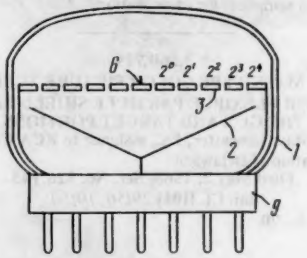
phosphor and light-abosrbing diclectric layers to reduce interface reflectance, light scattering and halation.

3,560,785

GAS DISCHARGE DISPLAY INSTRUMENT

Fedor Evgenievich Temnikov, Lefortovskyval, 7/6, korpus 3, kv. 41; Vyacheslav Dmitrievich Savin, Gospitalny val, 3. korpus 1, kv. 10u, and Jury Alexeevich Ivashkin, prospekt Mira, 118, kv. 214, Moscow, U.S.S.R.

Filed Nov. 7, 1968, Ser. No. 773,993
Int. Cl. H01j *7/42*
U.S. Cl. 313—109.5 **7 Claims**



A gas-discharge display instrument for indicating digital magnitudes includes a common electrode and a group of electrodes spaced therefrom and operatively associated therewith. The group of electrodes are concentrically arranged. Each electrode in the group successively corresponds to a respective digit in a series of a succession of digits and is adapted to illuminate over the periphery thereof to indicate the digit corresponding thereto.

3,560,786

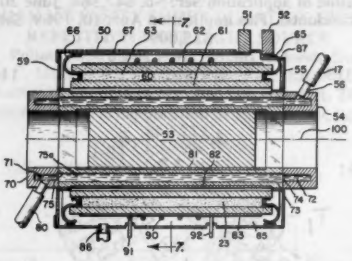
FLUORESCENT LAMP WITH VARIABLE DEFORMATION IN ENVELOPE

Joel Shurgan, Washington Township, Bergen County, N.J., assignor to Duro-Test Corporation, Bergen, N.J., a corporation of New York

Continuation of application Ser. No. 660,152, July 20, 1967, which is a continuation-in-part of application Ser. No. 453,643, May 6, 1965, now abandoned. This application Oct. 15, 1968, Ser. No. 768,618
Int. Cl. H01j *61/30, 61/35*
U.S. Cl. 313—109 **21 Claims**

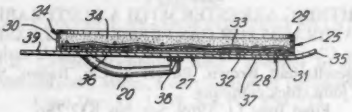
A fluorescent lamp having at least one groove therein which is rotated on a curved path around and along the longitudinal axis of the lamp and which varies in depth.

3,560,787
FLASH LAMP
Burton R. Clay, Wayland, and Theodore A. Haddad, Lexington, Mass.
Original application Mar. 18, 1964, Ser. No. 353,009, Patent No. 3,454,900, dated July 8, 1969. Divided and this application Aug. 21, 1967, Ser. No. 671,181
Int. Cl. H01j *5/16*
U.S. Cl. 313—112 5 Claims



The invention disclosed herein provides for an improved flash lamp having an extremely high intensity which incorporates cylindrical inner and outer walls and has end members for sealing the walls and defining the space therebetween to confine the gas, and includes a coating on the outer walls specifically passing portions of the radiation so that the flash lamp generates a flash inwardly directed which contains desired bands of radiation.

3,560,788
R-F ENERGIZABLE, PAN-SHAPED GETTER FOR TELEVISION TUBE
Clair Reash, Fairview Park, and Vincent Pietrasz, Cleveland, Ohio, assignors to Union Carbide Corporation, New York, N.Y., a corporation of New York
Filed Dec. 11, 1968, Ser. No. 782,862
Int. Cl. H01j *19/70*
U.S. Cl. 313—174 6 Claims

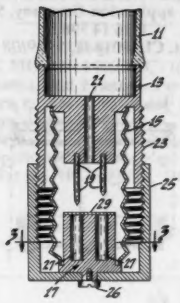


A getter device for mounting in an electron tube to be flashed by induction heating from a circular coil positioned externally of the tube, the getter being a pan-shaped container having a vertical sidewall formed around a circular floor member, with an annular portion of the floor member adjacent the sidewall having a greater thickness than the central core portion of the floor member.

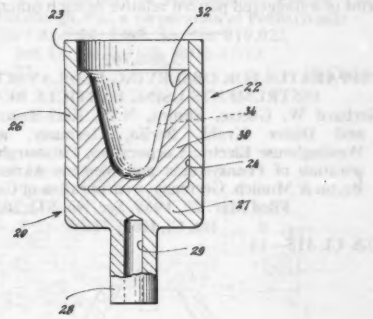
3,560,789
GASEOUS ELECTRIC DISCHARGE TUBE INCLUDING A PLURALITY OF PUNCTURABLE GAS STORAGE CELLS
Karl G. Hernqvist, Princeton, and James Robert Fendley, Jr., Trenton, N.J., assignors to RCA Corporation, a corporation of Delaware
Filed Jan. 31, 1969, Ser. No. 795,576
Int. Cl. H01j *17/26*
U.S. Cl. 313—177 4 Claims

A replenishable gas discharge tube comprises a plurality of closed cells within the tube envelope, each cell containing a quantity of the ionizable gas, and means operable from outside the tube envelope for successively opening the cells to release the gas within the envelope.

In one form of the invention, a plurality of pins are appropriately arranged within the tube envelope, which comprises a gas-tight bellows. The pins are caused to successively puncture the covers of the closed cells by increasing the engagement of two threaded members engaged outside the envelope, which movement is permitted by the bellows.



3,560,790
ALKALI METAL CATHODE LAMPS
John W. Vollmer, Norwalk, and Laurence Pellier, Westport, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn., a corporation of New York
Filed July 27, 1967, Ser. No. 656,564
Int. Cl. H01j *17/04*
U.S. Cl. 313—218 5 Claims



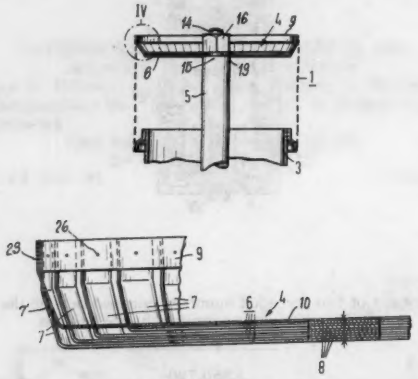
The radiation emitting cathode of spectral source lamps often is a hollow cup, the interior of which contains a coating of the spectrally emitting element or elements. The forming of such a coating of an alloy of an alkali metal (or metals) with, say, tin in the presence of some boron is proposed, resulting in higher melting points and lower vapor pressures, thereby allowing higher operating lamp currents and consequent spectral radiation intensity. The coating material is formed, say, directly on the interior of the cathode cup (say, of titanium) by fusing an alkali metal borohydride with tin, thereby avoiding the need to handle pure alkali metal. The hydrogen gas liberated during alloy formation removes some of the contaminants (e.g., oxides). A boron-containing, glassy slag may be readily separated from the alkali metal alloys. Specific examples in which the alkali metal component is sodium, potassium, or a mixture of sodium and potassium are disclosed. The other metal may be, for example, tin or lead.

3,560,791

MESH CATHODE FOR ELECTRON TUBES

Wilhelm Bertelsmann, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany, a corporation of Germany

Filed Sept. 6, 1968, Ser. No. 758,059
Claims priority, application Germany, Sept. 8, 1967, P 16 14 598.5
Int. Cl. H01j *1/15, 19/08*
U.S. Cl. 313—341 9 Claims



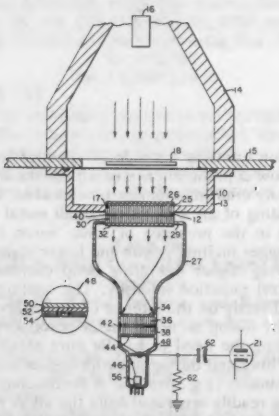
A mesh cathode comprising a tubular mesh grid formed of electron-emitting wires; the tubular grid having one end portion thereof fastened to an annular heating current supply terminal and having the other end portion thereof attached to a cap which is supported on a rod disposed coaxially of the tubular grid. The rod and the cap cooperate to form a second heating current supply terminal. The cap comprises a plurality of laminar members each having a plurality of arms extending radially outwardly from a centrally disposed hub having an aperture therethrough for fittingly engaging the supporting rod. The laminar members are arranged with the arms in a staggered pattern relative to each other.

3,560,792

APPARATUS FOR OBSERVING DISPLAY SCREENS OF INSTRUMENTS USING PARTICLE BEAMS

Gerhard W. Goetze, Elmira, N.Y.; Karl-Heinz Herrmann, and Dieter Krahl, Berlin, Germany, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania and Siemens Aktiengeselischaft, Berlin & Munich, Germany, a corporation of Germany

Filed Mar. 26, 1969, Ser. No. 811,283
Int. Cl. H01j *31/08*
U.S. Cl. 315—11 6 Claims



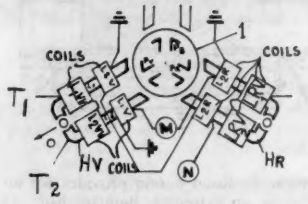
Apparatus associated with a device, such as an electron microscope, in which fiber optic coupling is utilized in combination with a secondary electron conduction type camera tube for deriving an electrical signal representative of low light level emitted from the phosphor within an electron microscope.

3,560,793

COLOR TELEVISION CONVERGENCE SYSTEM

MIchel Payen, Vincennes, France, assignor to Societe Orega Electronique & Mecanique, a corporation of France

Continuation of application Ser. No. 647,564, June 20, 1967, now abandoned. This application Apr. 10, 1969, Ser. No. 815,009
Int. Cl. H01j *29/50*
U.S. Cl. 315—13 11 Claims



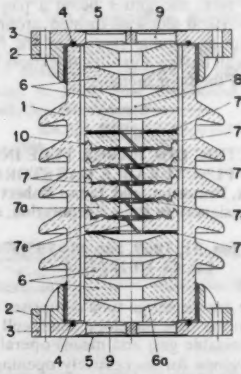
The convergence correction device for three-gun tubes according to the invention is of the type comprising, for corrections at line and field period, for each red or green gun, a single magnetic circuit around which are wound coils carrying currents which generate the magnetic correction fields, these currents being of line and field frequencies. It is essentially characterized in that each of the windings corresponding respectively to red and to green is divided into a first and a second element: the first red and green elements receive in parallel a correction current whose purpose is to bring the two points of impact corresponding to the same signal on the same vertical line on the screen. The second red and green elements are coupled so as to generate two fields of the same amplitude but of opposite sign to bring these two points on the same horizontal line on the screen.

3,560,794

LIGHTNING ARRESTER WITH A RUPTURABLE DIAPHRAGM FOR GAS PRESSURE RELEASE

Hanspeter Christener, Schofflisdorf, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland, a joint stock company

Filed June 11, 1969, Ser. No. 832,286
Claims priority, application Switzerland, June 12, 1968, 8745/68
Int. Cl. H02h *3/22, 7/24, 9/06*
U.S. Cl. 315—36 5 Claims



A voltage surge arrester comprises one or more columns of stacked spark gaps and resistors located within a closed cas-

ing and which are connected electrically in series. In order to prevent the casing from fracturing as a result of the high thermal and mechanical stresses which are created by arcing within the casing, the spark gaps and resistors are given an annular configuration thereby to establish a continuous and approximately central channel through them and a pressure relief device is situated in the immediate vicinity of each end of the channel.

3,560,795

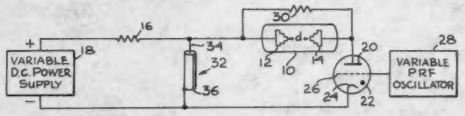
HIGH INTENSITY SHORT DURATION HIGH REPETITION RATE LIGHT SOURCE

Slava A. Pollack, 350 Palos Verdes Blvd, Redondo Beach, and Richard C. Mackey, 6228 Belmar Ave., Reseda, Calif. 91335

Continuation of application Ser. No. 505,500, Oct. 28, 1965, now abandoned. This application Sept. 29, 1969, Ser. No. 864,272

Int. Cl. H05b *37/00*

U.S. Cl. 315—240 **15 Claims**



A light source having a lamp envelope with electrodes positioned therein a predetermined distance apart. A gaseous medium is provided within the envelope which has a predetermined pressure for providing a minimum duration maximum intensity output light pulse characteristic of the gascous medium when a voltage pulse of comparable duration is applied across the electrodes to ionize the gaseous medium. The voltage pulse is provided by a pulse-forming circuit which is adapted to be changed to a predetermined voltage from a source of electrical energy to generate the voltage pulse having a time duration comparable to the duration of the output light pulse. A circuit is also provided for periodically connecting the pulse-forming circuit to the electrodes to discharge the voltage pulse through the gaseous medium.

3,560,796

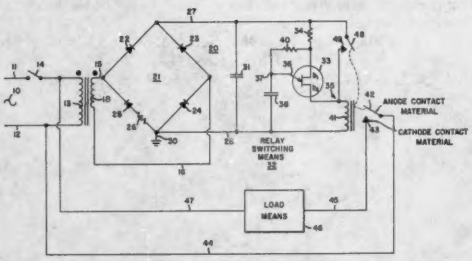
RELAY CONTROL SYSTEM FOR PREVENTION OF CONTACT EROSION

William R. Landis, Richfield, Minn., assignor to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware

Filed Dec. 11, 1969, Ser. No. 884,211

Int. Cl. H01h *47/32*

U.S. Cl. 317—11 **10 Claims**



A control system for energizing an electrical relay and electrical load from a source of alternating current so that any relay contact bounce occurs during a portion of the applied alternating current source in a fashion to eliminate contact erosion. The control of the relay is accomplished by a synchronous switching means that is responsive to a voltage ripple superimposed on a direct current voltage from a bridge. The bridge contains an impedance which unbalances the voltage ripple in such a manner as to provide for a predictable mode of synchronous switching. The relay contacts are selected of dissimilar materials and operate with the predictable mode of synchronous switching so that there is little or no erosion of the contacts themselves.

3,560,797

ELECTRIC MOTOR PROTECTION DEVICES

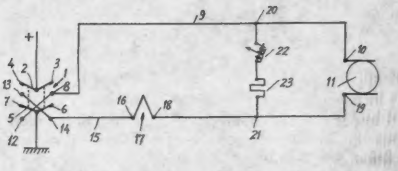
Jean Pineau, Suresnes, and Francois Peroy, Bourg-La-Reine, France, assignors to Regie Nationale Des Usines Renault, Billancourt (Hauts de Seine), France

Filed Sept. 12, 1968, Ser. No. 759,392

Claims priority, application France, Sept. 15, 1967, 121,165

Int. Cl. H02h *7/085, 5/04*

U.S. Cl. 317—13 **4 Claims**



An auxiliary overload breaker circuit parallel to the motor circuit comprises a member enabling said circuit to receive a considerable current in relation to the maximum current flowing through the motor and to which it is added when flowing through the breaker, thus reducing to a substantial proportion the opening time of the breaker.

3,560,798

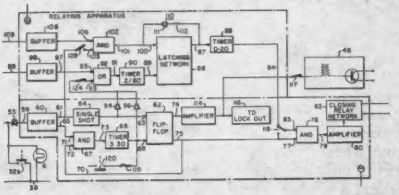
BREAKER RECLOSING AND LOCKOUT RELAY

Nathaniel D. Tenebaum, Plainfield, and Walter A. Elmore, Millington, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Apr. 24, 1969, Ser. No. 819,022

Int. Cl. H02h *3/08;* **H01h** *47/18*

U.S. Cl. 317—22 **26 Claims**



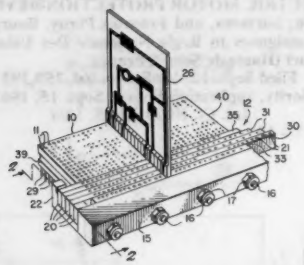
A reclosing solid state relaying network which eliminates the necessity for the usual 52*x* breaker contact (a contact that closes during the closing movement of a power circuit breaker) and utilizes an existing 52*b* contact (which is a contact closed solely when the breaker is in wide open condition) associated with the usual green lamp used to indicate an open circuit condition of the breaker thereby eliminating the cost of the additional wiring from the switch yard to the control house and enabling the use of breakers having no 52*x* contact. The solid state relaying network may be arranged to control the operation of a single breaker or in its more complete form arranged to control a plurality of breakers in a "breaker-and-a-half or ring bus arrangement" to lockout upon the second reclosure of a breaker into a faulted power line thereby eliminating further breaker reclosures upon a faulted line as occurred in prior art systems.

3,560,799

BUS BAR BUILDING BLOCK ASSEMBLY

Philip J. Bochicchio, Ellicott, Md., assignor to the United States of America as represented by the Secretary of the Army

Filed Oct. 22, 1968, Ser. No. 769,589
Int. Cl. H02b 1/02
U.S. Cl. 317—101 10 Claims



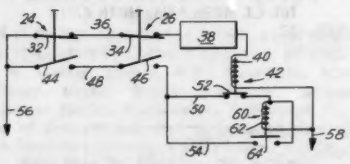
An apparatus for removably retaining preformed circuit cards in prearranged circuit configuration, wherein a panelboard bus bar, building block assembly comprises a plurality of bus bars, with apertures therethrough, affixed to a switchboard, having similar apertures therein, situated so that the preformed circuit cards can be removably plugged into the panelboard and bus bar assembly simultaneously.

3,560,800

ELECTRICAL SAFETY STRUCTURE

Morris Weidenfeld, Bayside, N.Y., assignor to Morris Weidenfeld, a part interest and Abraham Weidenfeld, New York, N.Y., a part interest

Filed Dec. 28, 1967, Ser. No. 694,182
Int. Cl. H01h 47/00
U.S. Cl. 317—135 4 Claims



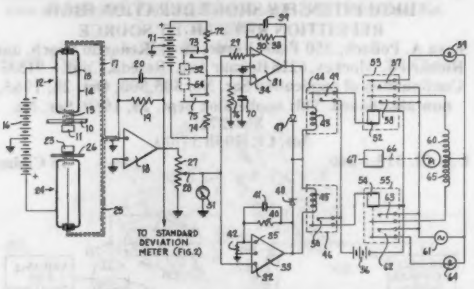
An electrical safety structure designed to prevent injury to an operator of a machine. This safety structure includes a safety circuit and an operating circuit for operating a machine when this latter circuit is closed. A pair of series-connected normally closed switches are located in the safety circuit and a pair of series-connected normally open switches are located in the control circuit and are respectively coupled with the normally open switches to form with the latter a pair of switch units spaced from each other by a distance too great to be operated by one hand of the operator. A control switch means maintains part of the operating circuit closed as long as the normally closed switches of the safety circuit remain in their closed positions and operates to enable the operator to actuate both of the switch units simultaneously to provide for simultaneous closing of both normally open switches along with simultaneous opening of both normally closed switches so that the operating circuit will be closed by the pair of series-connected normally open switches only by simultaneous actuation of both switch units and not by separate actuation of either one of the switch units. Because the operator must use both hands for simultaneous operation of the switch units, the operator's hands cannot be located at a part of the machine where the operator can be injured when the machine is actuated by closing the operating circuit.

3,560,801

SYSTEM AND METHOD FOR ELECTRICALLY CONTROLLING A CHARACTERISTIC OF A MANUFACTURING FLOW PROCESS

Colin S. McArthur, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C., a corporation of New Jersey

Filed Feb. 14, 1968, Ser. No. 707,021
Int. Cl. A24b 7/14; E01f 1/16; H03f 21/00
U.S. Cl. 317—137 9 Claims



Apparatus and method for controlling a characteristic of a stream of moving material, specifically for controlling the density of a rod of cigarette stock, including means for measuring the characteristic at a predetermined point in the flow of the material, means for converting said measurement into an electrical input signal having an amplitude and a polarity respectively indicative of the magnitude and sense of deviation of the characteristic from a predetermined value, and means for controlling the characteristic located upstream from the deviation measuring means and controlled in response to the signal.

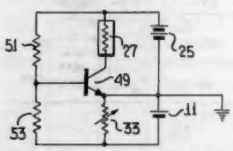
Means is provided for producing an anticipation signal concurrently with the actuation of the deviation-correcting control means and for introducing the anticipation signal into the control means in opposition to the effect of the input signal, so as to compensate for the timelag between the instant when a correction is made by the control means and the instant when the corrected stream of moving material reaches the deviation-measuring means. The anticipation signal increases in amplitude as a function of time. It is effective to stop operation of the control means before the measured characteristic has returned to its preselected value, and hence to prevent establishment of an oscillating or hunting condition of the control means.

3,560,802

TIMER EMPLOYING CURRENT DRAIN CHARACTERISTIC OF BATTERY

Garrard Mountjoy, and John D. Reid, Little Rock, Ark., assignors to Baldwin Electronics, Inc., Little Rock, Ark., a corporation of Arkansas

Filed Aug. 18, 1967, Ser. No. 661,633
Int. Cl. H01h 47/18
U.S. Cl. 317—142 4 Claims

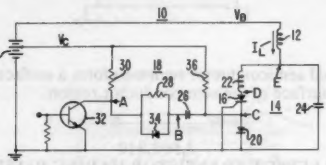


A timer comprising a battery, an impedance connected in circuit with the battery for progressively draining the battery, and a device actuable when the battery has been drained to a sufficiently low level.

3,560,803
ACTUATOR SYSTEM

Kelvin Shih, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich., a corporation of Michigan

Filed July 5, 1968, Ser. No. 742,764
Int. Cl. H01h *47/32*
U.S. Cl. 317—151 **3 Claims**

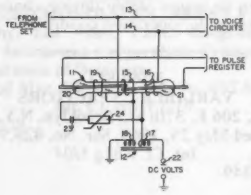


An actuator system having a parallel inductor-capacitor circuit connected in electrical series with the actuator coil. The capacitor follows a positive half cycle oscillation and thereby becomes reversed charged. A silicon controlled rectifier, responsive to the negative half cycle of oscillation, electrically connects the reversed charged capacitor in series with the supply voltage and thereby providing an increased operating voltage to the actuator coil. The capacitor is recharged through the actuator coil completing the operation of the actuator.

3,560,804
BATTERY-FEED AND IMPULSING CIRCUIT USING A FAST-OPERATING RELAY

Emiel Goossens, Aartselaar, and Herman Labedz, Risensart, Belgium, assignors to Automatic Electric Laboratories, Inc., Northlake, Ill., a corporation of Delaware

Filed July 14, 1969, Ser. No. 841,373
Int. Cl. H01h *47/02*
U.S. Cl. 317—155.5 **6 Claims**



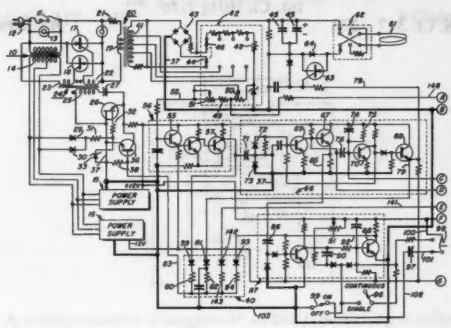
A reed relay has an operating winding connected in series with an audiofrequency choke coil and an auxiliary winding coupled to the choke coil to aid fast operation and release of the contacts of the relay. The choke coil provides high impedance to voice signals, and its coupling to the auxiliary winding compensates for the tendency of the relay to operate more slowly than usual as a result of the inclusion of the high inductance of the choke coil in the operating circuit of the relay. Also, the auxiliary winding causes release of the contacts even though line leakage current is excessive. A varistor effectively functions to disconnect the auxiliary winding during transmission of voice signals.

3,560,805
APPARATUS FOR TREATING PERMANENT MAGNETS

Everett A. Gilbert, Denville, and Channing S. Williams, Rockaway, N.J., assignors to RFL Industries, Inc., Boonton, N.J., a corporation of New Jersey

Filed July 12, 1968, Ser. No. 744,439
Int. Cl. H01f *13/00*
U.S. Cl. 317—157.5 **19 Claims**

Apparatus for selectively decreasing the magnetic intensity of a permanent magnet by passing current pulses of decaying waveform through a pulldown coil. A capacitor is alternately charge to a predetermined voltage level and discharged through the pulldown coil. Control means are provided to pass through the pulldown coil either a single current pulse of predetermined maximum amplitude, or a continuous series

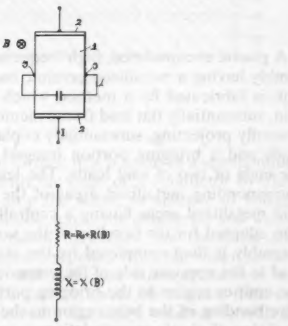


of such pulses or a train of current pulses of increasing initial amplitude.

3,560,806
MAGNETIC INDUCTIVE SEMICONDUCTOR DEVICE

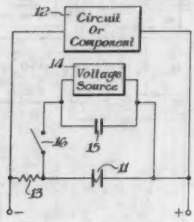
Shoei Kataoka; Hideo Yamada; Shosan Iida, and Hiroyuki Fujisada, Tokyo, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan, a corporation of Japan

Filed Jan. 16, 1968, Ser. No. 698,234
Claims priority, application Japan, Jan. 21, 1967, Mar. 15, 1967, June 2, 1967, July 4, 1967, July 4, 1967, Aug. 3, 1967, Aug. 12, 1967, Dec. 4, 1967, Dec. 12, 1967, Dec. 12, 1967, 42/3872;U.M.42/21180;42/34888;42/42552;42/42553; 42/49499;42/51470;42/77370;42/79260;42/79261
Int. Cl. H01l *15/00*
U.S. Cl. 317—231 **14 Claims**



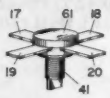
A solid state inductive device comprises either a sandwich of a N-type and a P-type semiconductor with an insulating layer therebetween, or a semiconductor and a plurality of metal strips with a dielectric layer therebetween. A current electrode is connected to the opposite ends of the semiconductor and interconnect the semiconductors in the first embodiment, the metal strips being angular to the direction of the electrodes in the second embodiment. The device forms an inductive reactance between the electrodes upon application of a magnetic field in an angular direction to a side of the device.

3,560,807
MULTI-SHOT VOLTAGE SENSITIVE SWITCH ASSEMBLY
Ernest N. Urfer, and Henry F. Puppolo, North Adams, Mass., assignors to Sprague Electric Company, North Adams, Mass., a corporation of Massachusetts
Filed Feb. 25, 1969, Ser. No. 802,016
Int. Cl. H01g 1/16
U.S. Cl. 317—231 **4 Claims**



A multishot voltage-sensitive switch is provided by a solid state device consisting of a thin film dielectric sandwiched between an electrode and a thin film counterelectrode. The switch closes upon the application of a voltage in excess of a rated voltage and is cleared by application to the switch of a high current, low voltage pulse.

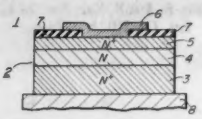
3,560,808
PLASTIC ENCAPSULATED SEMICONDUCTOR ASSEMBLIES
Eugene E. Segerson, Tempe, Ariz., assignor to Motorola Inc., Franklin Park, Ill., a corporation of Illinois
Filed Apr. 18, 1968, Ser. No. 722,471
Int. Cl. H01l 1/06
U.S. Cl. 317—235 **6 Claims**



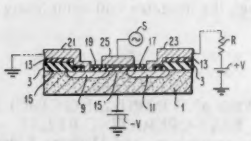
A plastic encapsulated, high-frequency power transistor assembly having a metallized ceramic base and a metallic heat sink is fabricated by a method which includes the use of a thin, substantially flat lead frame member having at least four inwardly projecting, substantially coplanar electroconductive leads and a bridging portion integral therewith connecting the ends of two of said leads. The lead ends are bonded to corresponding metallized areas of the ceramic base, one of said metallized areas having a centrally extended configuration adapted for die bonding of the semiconductor unit. The assembly is then completed by the attachment of a metallic stud to the opposite side of the ceramic base, wire bonding of the emitter region to the bridging portion of the lead frame, wire bonding of the base region to the remaining lead, and a final step of plastic encapsulation.

3,560,809
VARIABLE CAPACITANCE RECTIFYING JUNCTION DIODE
Hajime Terakado, Kodaira-Shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan, a corporation of Japan
Filed Feb. 27, 1969, Ser. No. 802,845
Claims priority, application Japan, Mar. 4, 1968, 43/13623
Int. Cl. H01l 9/00
U.S. Cl. 317—234 **4 Claims**

A variable capacitance diode comprising a super abrupt junction therein, said diode comprising a semiconductor wafer including a semiconductor region having a graded impurity concentration, and a metal layer deposited on one surface of said semiconductor region to form a surface barrier at said one surface of the semiconductor region.

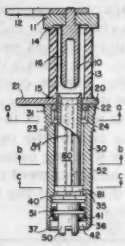


3,560,810
FIELD EFFECT TRANSISTOR HAVING PASSIVATED GATE INSULATOR
Pieter Balk, Katonah; David W. Dong, Peekskill, and Jerome M. Eldrige, Mahopac, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York
Filed Aug. 15, 1968, Ser. No. 752,897
Int. Cl. H01l 11/14
U.S. Cl. 317—235 **12 Claims**



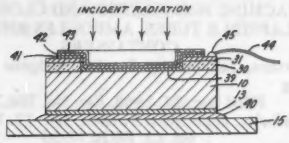
An insulated-gate field effect transistor is described which includes a gate insulator defined as a laminate structure comprising a phosphosilicate glass (PSG) layer and a silicon dioxide (SiO_2) layer, the ratio of the thicknesses of such layers and, also, the P_2O_5 concentration in the PSG layer being properly chosen to insure stable device characteristics over extended periods under operation conditions.

3,560,811
VARIABLE CAPACITORS
George Farago, 206 E. 37th St., Brooklyn, N.Y. 11203
Filed May 29, 1969, Ser. No. 828,971
Int. Cl. H01g 5/04
U.S. Cl. 317—249 **5 Claims**



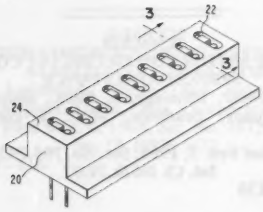
In the variable capacitors of the coaxial type where a tubular electrode is moved by screw or similar action to engage more or less a stationary electrode, and dielectric is between the electrodes, a spring-stressed means is provided to establish direct contact between the movable electrode and a circuit, which said spring-stressed means can be also the rotation restraining element and the positive stop for the movable electrode.

3,560,812
HIGH SELECTIVELY ELECTROMAGNETIC RADIATION DETECTING DEVICES
Robert N. Hall, Schenectady; Richard D. Baertsch, Scotia, and John R. Richardson, Schenectady, N.Y., assignors to General Electric Company, a corporation of New York
Filed July 5, 1968, Ser. No. 742,655
Int. Cl. H01l *15/00, 5/00*
U.S. Cl. 317—234 4 Claims



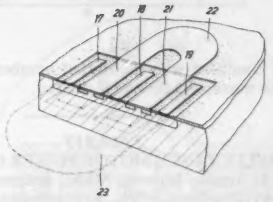
A high selectivity solid-state radiation detector having a Schottky barrier-type junction is fabricated by depositing a thin silver film of prescribed thickness atop a semiconductor crystal to form a sharp silver-to-semiconductor interface. The film allows a narrow band of the electromagnetic radiation incident thereon to pass therethrough into the semiconductor. Such radiation band is at an energy which is greater than the energy gap of the semiconductor and is thereby strongly absorbed, producing electron-hole pairs within the space-charge region of the barrier and giving rise to a photoelectromotive force or photoconductivity that peaks at an energy of radiation greater than the energy gap. If the radiation transmitted by the silver film is of energy less than the band gap of the semiconductor it is only weakly absorbed in the semiconductor, and therefore produces negligible response. By varying the film thickness, the selectivity and peak sensitivity may be further controlled.

3,560,813
HYBRIDIZED MONOLITHIC ARRAY PACKAGE
William S. Phy, Los Altos, Calif., assignor to Fairchild Camera and Instrument Corporation, Syosset, Long Island, N.Y., a corporation of Delaware
Filed Mar. 13, 1969, Ser. No. 807,633
Int. Cl. H01l *1/16*
U.S. Cl. 317—234 10 Claims



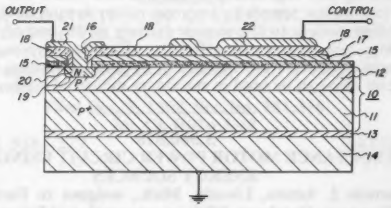
Prior to packaging, support and interconnect leads are bonded to a semiconductor die containing light-sensitive components, enabling the photoresponse of each component to be tested. A plurality of similar semiconductor dice are then selected according to a desired photoresponse, and can be assembled into a package. The need for additional bonding with respect to the die is eliminated. Unwanted variations in photoresponse during the packaging process are prevented from occurring, and the similarity in photoresponse between components is maintained.

3,560,814
TRANSISTOR WITH STRIP SHAPED EMITTER
Reiner Engbert, Talheim, and Reinhold Kaiser, Heilbronn, Germany, assignors to Telefunken Patentverwertungsgesellschaft m. b. H., Ulm, Danube, Germany
Filed Apr. 8, 1968, Ser. No. 719,641
Claims priority, application Germany, Apr. 8, 1967, T33623
Int. Cl. H01l *11/00, 19/00*
U.S. Cl. 317—235 5 Claims



A semiconductor arrangement of the type having a collector zone of a first conductivity type, a base zone of a second conductivity type and an emitter zone of the first conductivity type. Part of the base zone is arranged to extend through an opening in the emitter zone and is short-circuited to the emitter zone.

3,560,815
VOLTAGE-VARIABLE CAPACITOR WITH EXTENDIBLE PN JUNCTION REGION
Raymond A. Sigsbee, Schenectady, N.Y., assignor to General Electric Company, a corporation of New York
Filed Oct. 10, 1968, Ser. No. 766,605
Int. Cl. H01l *5/02*
U.S. Cl. 317—235 16 Claims

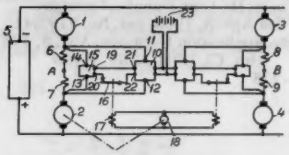


A PN junction region formed in a portion of a semiconductor wafer extends beneath the edge of a conductor overlaid on an insulating layer atop the wafer, in absence of voltage above a threshold amplitude across the conductor and wafer. As this voltage is increased to exceed the threshold amplitude, majority carriers are repelled from the wafer surface beneath the conductor and sufficient minority carriers are accumulated near the surface to invert the surface. This extends the PN junction beneath the entire conductor, with an attendant increase in junction capacitance.

3,560,816
DRIVING SYSTEM FOR TRACTION PURPOSES
Sigfrid Franzen, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden, a Swedish corporation
Filed Oct. 14, 1968, Ser. No. 767,395
Claims priority, application Sweden, Oct. 17, 1967, 14,171/67
Int. Cl. H02p *7/70*
U.S. Cl. 318—52 4 Claims

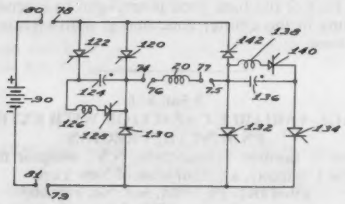
An electrical traction system with parallel-connected

groups of series motors is provided with means for switching



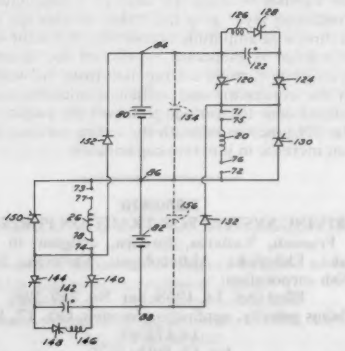
over to a condition with a constant number of field ampere turns when maximal adhesion is desired.

3,560,817
RELUCTANCE MOTOR POWER CIRCUIT
Carmelo J. Amato, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware
Filed Jan. 31, 1969, Ser. No. 795,410
Int. Cl. H02k *29/02*
U.S. Cl. 318—138 **12 Claims**



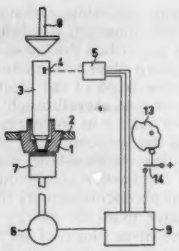
Conventional SCRs and diodes are used to apply DC electric power from a storage battery to a winding of a reluctance-type motor. The circuit provides full and partial motoring and regenerative braking, freewheels the winding current at low speeds to improve motor torque, and returns winding current to the storage battery at the end of the motoring cycle to improve efficiency. Electrically powered automotive vehicles use the circuit to great advantage and the circuit also can be used in stationary industrial applications.

3,560,818
RELUCTANCE MOTOR POWER CIRCUIT USING DUAL ENERGY SOURCES
Carmelo J. Amato, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware
Filed Feb. 3, 1969, Ser. No. 795,792
Int. Cl. H02k *29/02*
U.S. Cl. 318—138 **11 Claims**



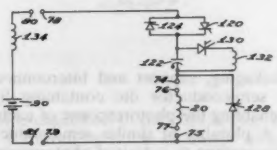
Power is supplied to pairs of motor windings having varying inductances during motor operation from two batteries connected in series. Conventional SCRs and diodes shape winding current to achieve highly efficient motor operation, provide full and partial motoring and regenerative braking, and return winding current to the batteries at the ends of the motoring cycle to improve efficiency. One battery supplies operating current to one motor winding and the residual current from that winding is returned to the second battery, which supplies operating current to the second winding. Residual current from the second winding is returned to the first battery.

3,560,819
MACHINE FOR FILLING AND CLOSING OF COLLAPSIBLE TUBES, AMPOULES AND SIMILAR CONTAINERS
Rudolf Overa, Jakobsberg, Sweden, assignor to Arenco Aktiebolag
Filed Dec. 24, 1968, Ser. No. 786,707
Claims priority, application Sweden, Jan. 12, 1968, 445/1968
Int. Cl. H02k *37/00*
U.S. Cl. 318—138 **5 Claims**



The invention relates to a device for rotating collapsible tubes or similar containers into a predetermined position for closing the open end of each tube. The device comprises a spindle driven by an electric multipolar electric step motor having a number of poles corresponding to the desired angular movement of each step. The motor is driven one step for each pulse in a pulse train from an oscillator with variable pulse frequency, said pulse train during a first time interval (t_1 to t_2) having a relatively low pulse frequency which during a second time interval (t_2 to t_3) is increased to a maximum value, said first time interval corresponding to the time consumed by the spindle cause it without any substantial slip relative the container to accelerate the same from zero to the predetermined rotational speed, which is determined by the frequency of the pulses emitted from the oscillator during said second time interval.

3,560,820
RELUCTANCE MOTOR POWER CIRCUIT CONTAINING SERIES CAPACITANCE
Lewis E. Unnewehr, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware
Filed Feb. 3, 1969, Ser. No. 795,793
Int. Cl. H02k *29/02*
U.S. Cl. 318—138 **9 Claims**



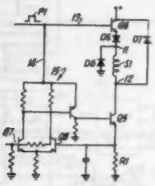
A commutating capacitor is coupled in series with a DC battery and the winding of a reluctance-type motor. In series with the capacitor is a circuit consisting of an SCR in parallel

with a reverse biased diode or a second SCR. An SCR is coupled in parallel with the winding to freewheel winding current. Another SCR in series with an inductor can be coupled in parallel with the capacitor to reverse the capacitor charge.

3,560,821
PULSE TYPE DRIVE CIRCUIT FOR AN INDUCTIVE LOAD

Thomas E. Beling, Framingham, Mass., assignor to Sigma Instruments, Inc., South Braintree, Mass., a corporation of Massachusetts

Filed Apr. 21, 1969, Ser. No. 817,880
Int. Cl. H02k *29/04*
U.S. Cl. 318—138 **12 Claims**



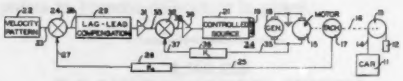
A pulse-type drive circuit, for an inductive load such as a winding of a stepping motor, comprises a power supply having one terminal connected, through a first transistor, to a first terminal of the inductive load. The second terminal of the inductive load is connected through a transistor switch, and in series with a current-sensing resistor, to ground. A Schmitt trigger controls conductivity of the transistor switch. A trigger pulse is applied to the first transistor and to the Schmitt trigger, whereby the first transistor and the transistor switch are made conductive to energize the inductive load. When the current in the inductive load reaches a certain level, the current-sensing resistor actuates the Schmitt trigger to block the transistor switch. The first terminal of the inductive load is connected to ground through a blocking diode, and the second terminal is connected to the power supply through a back biased diode. When the load current is interrupted by blocking of the transistor switch, the power in the inductive load is transferred back to the power supply.

The power supply may include a high voltage source connected to the first transistor and a low voltage source connected to the first terminal of the inductive load, with the first transistor being triggered by a "turn on" pulse. The drive circuit may be modified to energize a winding of a stepping motor in opposite directions throughout its entire length and a constant current feedback circuit may be included in the drive circuit.

3,560,822
MOTOR CONTROL HAVING A FEEDBACK STABLILIZED GENERATOR

Richard C. Loshbough, Toledo, Ohio, assignor to Reliance Electric Company, Euclid, Ohio, a corporation of Delaware

Filed Sept. 6, 1968, Ser. No. 757,929
Int. Cl. H02p *5/22*
U.S. Cl. 318—146 **1 Claim**

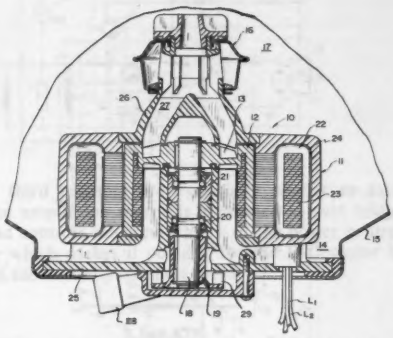


A variable voltage motor control wherein the hoist motor armature is supplied from a dynamoelectric machine having its characteristics linearized by a closed negative feedback loop including a controlled supply for its shunt field. The effective constant gain of the generator enhances operation particularly in elevator hoist motor controls.

3,560,823
LOW PROFILE MOTOR PUMP STRUCTURE

Arne M. Nystuen, Stevensville, Mich., assignor to Whirlpool Corporation, a corporation of Delaware

Filed Nov. 7, 1968, Ser. No. 774,050
Int. Cl. H02p *1/44*
U.S. Cl. 318—221 **6 Claims**

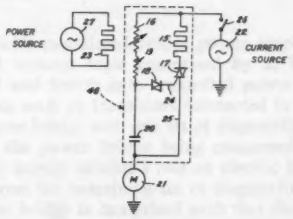


A yoke wound motor structure. The motor is adapted, as a result of its low profile, for facilitated installation such as in dishwasher applications. A pump is provided within the housing to form a compact motor-pump assembly. The toroidal yoke winding includes a portion arranged to provide a flux differing in phase from the flux generated by the main portion of the yoke winding during starting of the motor. The rotor may be a conventional squirrel cage rotor.

3,560,824
SPEED CONTROL OF AN ELECTRIC MOTOR EMPLOYING THERMALLY SENSITIVE RESISTANCE

Thomas F. Burke, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex., a corporation of Delaware

Filed Dec. 5, 1968, Ser. No. 781,316
Int. Cl. H02p *5/40*
U.S. Cl. 318—227 **14 Claims**



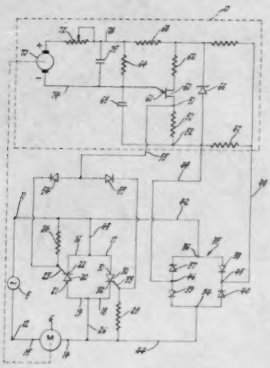
Control apparatus comprising a triac, serially connected to a load such as a motor, is gated through a diac. The diac conducts and turns on the triac during each half cycle of triac current when a capacitor has reached a predetermined charge through a charging resistor having a negative temperature coefficient of resistance. The NTC charging resistor gradually heats up (additional heat can also be supplied) with concomitant decrease in resistance and charge time of the capacitor so that the pulse of current seen by the motor gradually increases until a steady state condition is reached. A heating-cooling system is shown in which the above control is employed with a plurality of thermostats and a safety bypass circuit.

3,560,825

CIRCUIT ARRANGEMENT FOR ESTABLISHING AN ENERGIZING CIRCUIT FOR ALTERNATING CURRENT INDUCTION MOTORS

James O. Elliott, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed Nov. 29, 1968, Ser. No. 779,682
Int. Cl. H02p 5/40
U.S. Cl. 318—227 3 Claims



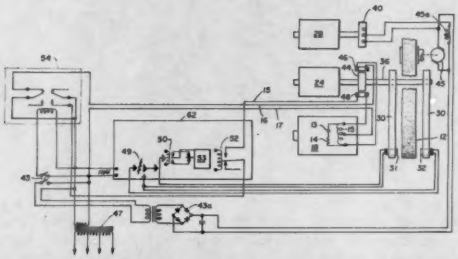
A circuit arrangement for establishing an energizing circuit for alternating current induction motors across a compatible alternating current supply potential source. Two silicon controlled rectifiers, each with a resistor connected across the gate-cathode electrodes thereof, are connected in parallel with each other in an opposite polarity relationship and in series with the motor to be energized and the alternating current input circuit terminals of a full wave diode bridge type rectifier circuit are connected across the silicon controlled rectifiers. Electrical trigger signals produced by an associated control circuit during each potential half cycle of the alternating current supply potential are applied across the negative output terminal of the bridge rectifier circuit and the alternating current input terminals thereof through the respective resistors, in parallel.

3,560,826

GRINDING WHEEL CONTROL SYSTEM AND APPARATUS

Robert F. Lonaberger, Reading, and Charles W. Stickler, Jr., Mohnton, Pa., assignors to Gray Tech Industries, Inc., Mohnton, Pa., a corporation of Pennsylvania. by mesne assignment

Filed Dec. 4, 1967, Ser. No. 687,733
Int. Cl. H02p 7/06; B24b 5/00
U.S. Cl. 318—306 7 Claims



A control system and apparatus for ultrasonic detection of wear of a grinding wheel and control of the peripheral speed thereof by maintaining it at a constant optimum value for increasing grinding wheel life.

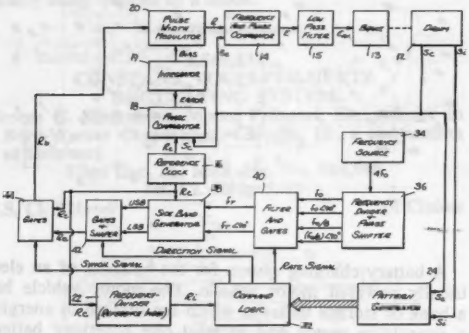
The control apparatus involves a minimum number of parts of relatively simple construction and highly reliable operation, a novel arrangement of ultrasonic sensors and speed-reducing means for a step motor operable to automatically adjust a potentiometer which controls the speed of the drive motor of the grinding machine to automatically compensate for variations in the diameter of the grinding wheel so as to maintain substantially constant peripheral speed of the grinding wheel to increase its efficiency and life.

3,560,827

SYSTEM FOR CONTROLLING THE VELOCITY AND POSITION OF A ROTATING MEMBER

Michael S. Schiller, New York, N.Y., assignor, by mesne assignments, to Security Trust Company of Rochester (Trustee), Rochester, N.Y., a banking corporation of New York

Filed May 9, 1969, Ser. No. 823,469
Int. Cl. H02p 7/70
U.S. Cl. 318—341 16 Claims



There is disclosed a system for controlling the rotational velocity and phase (position) of a continuously rotating device such as a magnetic drum. A measurement train of pulses is compared with a reference train of pulses in a closed loop to lock the rotational velocity of the drum to that dictated by the frequency of the reference train. Once during each full rotation of the drum a measurement index pulse is provided. This measurement index pulse is compared with a reference index pulse in a closed loop system to provide positioning (phase) control over the rotating drum. In order to provide both position and frequency control, side band generation is provided using the reference signal for the center frequency. The frequency of the modulating signal, and thus the deviation of the side band from center frequency, is determined by the magnitude of displacement between measurement index signal and the reference index signal. The upper or lower side band is selected as a function of the direction of displacement of the measurement index signal from the reference index signal. In any case, when there is an index error, a side band signal is employed as the command signal. This command signal is compared with the main measurement signal to cause the drum to speed up or slow down until the index error is eliminated. When index synchronization is achieved, the main reference signal is employed as the command signal so that the frequency of the drum is locked to that dictated by the main reference signal. In addition, once index synchronization has been achieved, further position control is provided within the span of a single measurement signal pulse by virtue of a modification to the width of the command signal pulses by an amount in a direction tending to cause measurement signal pulses and main reference signal pulses to become coincident in phase.

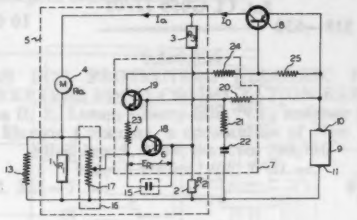
3,560,828

D.C. MOTOR CONTROL SYSTEM

Kazutsugu Kobayashi, Kadoma-shi, and Hisayuki Matsumoto, Moriguchi-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 3, 1967, Ser. No. 650,879
Int. Cl. H02p 5/16
U.S. Cl. 318—345 2 Claims

A D-C motor control system comprising a bridge circuit, a reference voltage means, an amplifying means, a power source and a power control transistor. The bridge circuit is formed by a D-C motor and three resistors. The temperature coefficient of the electric resistance of the first resistor is essentially similar to that of the armature winding of the D-C motor and the coefficients of the second and third resistors are essentially similar to each other. The amplifying means is connected to said bridge circuit and controls the conductivity of the power control transistor which makes it possible for the D-C motor to rotate at a substantially constant speed.

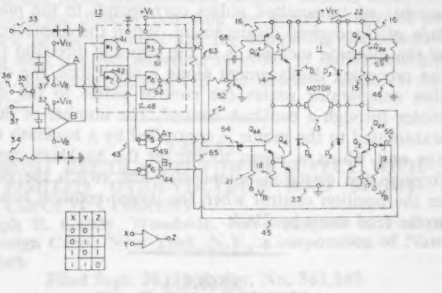


3,560,829

PULSE WIDTH MODULATED BRIDGE POWER AMPLIFIER WITH MEMORY AND LOCKOUT LOGIC

Donald F. Brennan, Dalton, Mass., assignor to General Electric Company, a corporation of New York

Filed Jan. 28, 1969, Ser. No. 794,738
Int. Cl. G05b 11/28
U.S. Cl. 318—599 15 Claims

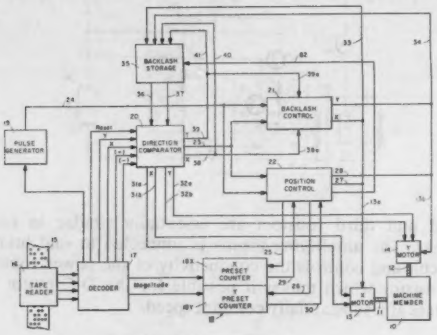


A pulse width modulated bridge power amplifier with memory and lockout logic comprised by at least first, second, third and fourth gate controlled power semiconductor devices such as transistors connected in the form of a Wheatstone bridge with one set of diagonally opposed terminals of the power bridge being connected across a pair of power supply terminals and an electric load being connected across the remaining set of diagonally opposed terminals. The bridge is comprised such that the first and second power semiconductor devices supply load current through the load in one direction and the third and fourth power semiconductor devices supply load current through the load in the opposite direction. The memory logic and lockout gating circuit is coupled to the control gates of the power gate controlled semiconductor devices for selectively gating on and locking out operation of desired ones of the devices to thereby provide proportionally controlled amounts of excitation current of a desired polarity through the load. The memory and lockout logic gating circuit comprises a polarity determining input circuit for providing pulse width modulated, reversible polarity, input control signals indicative of the polarity and magnitude of the excitation current to be supplied to the load.

3,560,830
POSITIONAL CONTROL SYSTEM WITH BACKLASH COMPENSATION

Walter A. Steinberg, Huntington Station, N.Y., assignor to Autonumerics, Inc., Westbury, N.Y., a corporation of New York

Filed Mar. 19, 1969, Ser. No. 808,526
Int. Cl. G05b *11/01*
U.S. Cl. 318—630 10 Claims

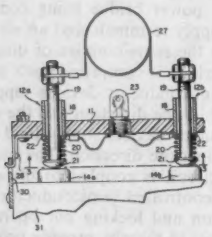


A positional control system is disclosed which includes means for automatically compensating for backlash in the feed screws coupling the drive motors to the driven machine member. When the displacement of the machine member along a given axis is to be in the same direction as the preceding displacement along that axis, a direction comparator routes control pulses to the drive motor through a position control. The number of pulses transmitted to the motor is determined by a counter which has been set to cut off the position control when the number of transmitted pulses corresponds to the magnitude of the desired displacement. When the displacement of the machine member is in the opposite direction from the preceding displacement along a given axis, the direction comparator routes the control pulses to the drive motor through a backlash control. The number of pulses transmitted to the motor is controlled by a backlash storage unit which is preset to cut off the backlash control through the direction comparator and switch the pulses to the position control when the motor rotation is equal to the feed screw backlash.

3,560,831
BATTERY LOAD BANK

Wendell T. Anderson, Canton, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Oct. 24, 1967, Ser. No. 677,689
Int. Cl. H02j *7/00*
U.S. Cl. 320—48 10 Claims

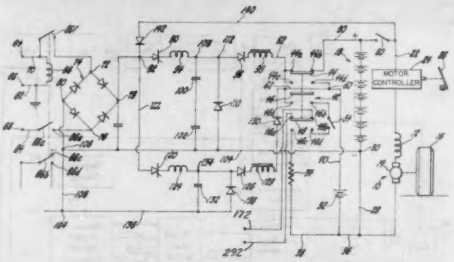


A load bank for independently discharging each cell of a multiple cell battery. A separate resistive load is provided for each cell, and a lamp corresponding to each cell indicates the completion of the discharge of a particular cell. The apparatus can be readily attached to or removed from a battery to be discharged.

3,560,832
BATTERY CHARGING SYSTEM FOR VEHICLES HAVING PROPULSION AND ACCESSORY BATTERIES

Thomas E. Kirk, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed May 5, 1969, Ser. No. 821,694
Int. Cl. H01m *45/05*
U.S. Cl. 320—56 7 Claims

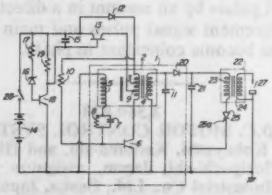


A battery charging system for the batteries of an electrically powered motor vehicle. The motor vehicle has a bank of storage batteries which are utilized to energize a propulsion motor and at least one accessory battery which is utilized to energize accessories on a motor vehicle. The battery charging system is capable of charging both the propulsion batteries and the accessory battery from a household source of alternating current. The batteries are supplied with charging current from a bridge rectifier through control circuits that include controlled rectifiers that are periodically switched on and off to control the amount of power applied to the batteries. The charging cycle of the battery consists of an initial constant power mode, a constant voltage mode and finally a timed shut-off mode of operation all of which are controlled automatically by the battery charging system. The battery charging system is arranged such that the controlled rectifier which controls the charging current to the main propulsion batteries is also operative to connect the accessory battery to the main propulsion batteries when the vehicle is running so as to allow the accessory battery to float across the main propulsion batteries whenever the charge level of the accessory battery drops to some predetermined value.

3,560,833
IGNITION DEVICE WITH LOW SOURCE VOLTAGE COMPENSATING CIRCUIT

Kazuo Oishi and Tokuhiro Kurebayashi, Kariya-shi, Japan, assignors to Nippon Denso Company Limited, Kariya-shi, Japan, a corporation of Japan

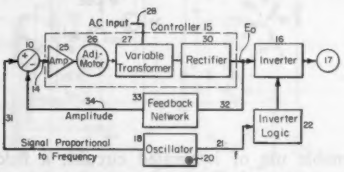
Filed Dec. 3, 1968, Ser. No. 780,854
Claims priority, application Japan, Nov. 30, 1968, 43/5,551
Int. Cl. F02p *3/06, 17/00;* H02m *3/22*
U.S. Cl. 321—2 8 Claims



A capacitor discharge type ignition device, wherein an intermediate tap is provided on a primary winding of an oscillator transformer incorporated in a DC–DC converter adapted for boosting the voltage of a storage battery, said

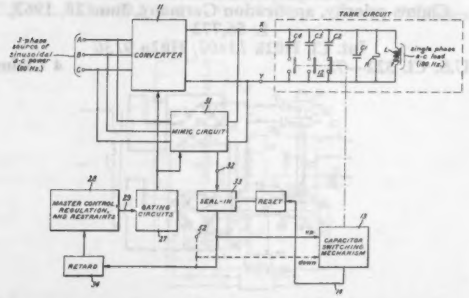
intermediate tap and that one of the terminals of said primary winding which is on the power source side are connected with the storage battery through a switching means which are under the control of a voltage control element adapted to detect the terminal voltage of said storage battery, and when the voltage of the storage battery is lower than a predetermined value, the battery is switched to said intermediate tap thereby to prevent the drop of the output voltage from said transformer, while a reverse current from said primary winding to the storage battery being stopped by a diode.

3,560,834
CONSTANT VOLTS-PER-HERTZ REGULATING SYSTEM
George H. Studtmann, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill., a corporation of Delaware
Filed Dec. 26, 1968, Ser. No. 786,908
Int. Cl. H02p *5/40*
U.S. Cl. 321—4 **14 Claims**



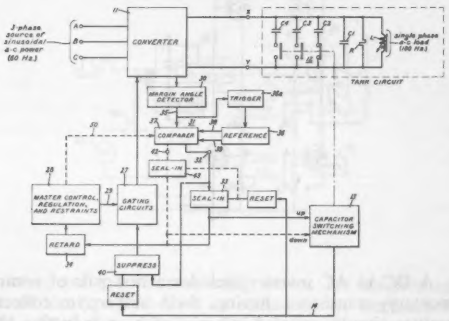
An oscillator applies timing signals to an inverter logic arrangement for governing the frequency of the inverter output A-C voltage supplied to a motor. The amplitude of the A-C voltage applied to the motor is adjusted by suitable control means which receives a regulating signal from a comparator. A first signal channel includes a feedback network, and applies to the comparator a first control signal which indicates the effective amplitude of the inverter voltage. A second signal channel is connected between the oscillator and the comparator to provide a second control signal related to the frequency of the oscillator output. The comparator output signal is a function of both amplitude and frequency, and drives the control means to maintain a preset ratio between amplitude and frequency of the A-C voltage passed to the motor.

3,560,835
MEANS FOR PROTECTING ELECTRIC POWER CONVERTER FROM COMMUTATION FAILURE
Charles E. Rettig, Brookfield, Wis., assignor to General Electric Company, a corporation of New York
Filed Jan. 3, 1969, Ser. No. 788,790
Int. Cl. H02m *5/14*
U.S. Cl. 321—7 **10 Claims**



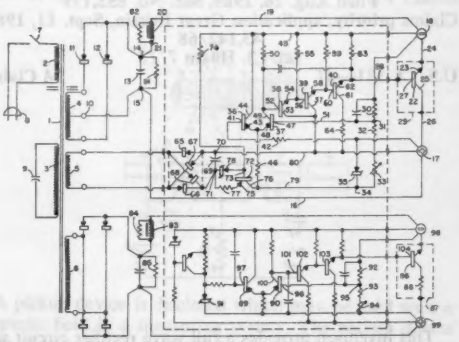
Power conversion apparatus using electric valves to control the power delivered from a source of electricity to a load circuit is protected from commutation failure by providing means responsive to the apparatus operating with a margin angle that is smaller than a desired minimum for activating means for adding capacitance to the load circuit. In one form of the invention, a reduced-scale, increased-sensitivity mimic conversion apparatus is used to detect incipient commutation failure.

3,560,836
MEANS FOR PROTECTING ELECTRIC POWER CONVERTERS FROM COMMUTATION FAILURE
Georges R. E. Lezan, Cherry Hill, N.J., assignor to General Electric Company, a corporation of New York
Filed Jan. 3, 1969, Ser. No. 788,718
Int. Cl. H02m *1/08, 5/00*
U.S. Cl. 321—7 **8 Claims**



In this improved circuit for protecting electric power converters from commutation failure, suitable means is provided for directly detecting the actual margin of an electric power converter and for comparing the detected angle with a given reference in order to initiate margin angle increasing measures if the detected angle is undersize.

3,560,837
SHUNT REGULATED POWER SUPPLY WITH LIMITED OVER-VOLTAGE AND SHORT-CIRCUIT CURRENT
Joseph R. Gately, Woodside, N.Y., assignor to Forbro Design Corp., New York, N.Y., a corporation of New York
Filed Sept. 20, 1968, Ser. No. 761,147
Int. Cl. H02m *1/18, 7/22*
U.S. Cl. 321—14 **7 Claims**



Shunt regulated power supplies are provided with low voltage drop in the unregulated supply and a small bleeder

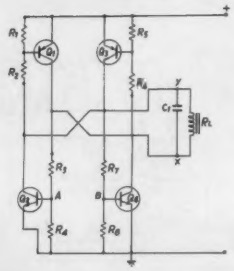
current to minimize over-voltage even on opening of the regulating circuit and low short-circuit current provided by flux-oscillating line regulating power transformer.

3,560,838

DIRECT CURRENT OR ALTERNATE CURRENT CONVERTER HAVING VARIABLE PULSE WIDTH AND FREQUENCY

Lawrence M. Weixelman, Wichita, Kans., assignor to Electronic Communications, Inc., St. Petersburg, Fla., a corporation of New Jersey

Filed Sept. 26, 1968, Ser. No. 762,733
Int. Cl. H02p *13/18;* H02m *1/08*
U.S. Cl. 321—16 **14 Claims**



A DC to AC inverter includes a first pair of complementary transistors having their respective collector-emitter circuits coupled in series with an inductive load. The second pair of complementary transistors similarly have their collector-emitter circuits coupled in series with the load. Of the respective pair, both first type transistors have their collector-emitter circuits coupled to a DC source terminal and both second type transistors have their collector-emitter circuits coupled to the other DC source terminal. The bases of the first type transistors are now simultaneously driven by an independent oscillator circuit to effect the conversion.

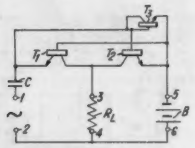
Two types of oscillator circuits are shown. The first includes an RC coupled oscillator of variable frequency, and the second a relaxation oscillator in tandem with a typical oscillator circuit to form a variable pulse width oscillator.

3,560,839

RECTIFIER CIRCUIT

Camillo Manansala Tabalba, Basildon, Essex, England, assignor to International Standard Electric Corporation, New York, N.Y., a corporation of Delaware

Filed Aug. 26, 1969, Ser. No. 853,179
Claims priority, application Great Britain, Sept. 11, 1968, 43,142/68
Int. Cl. H02m *7/12*
U.S. Cl. 321—47 **4 Claims**



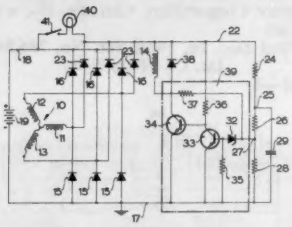
This invention provides a full wave rectifier circuit supplying an unbalanced load from an unbalanced source without the use of a transformer. One terminal of the source and the load is common. Two transistors, one in a common base and the other in a common emitter configuration, supply the load during alternate halfwaves. The circuit can be used either for unmodulated signals or as an envelope detector for amplitude modulated signals.

3,560,840

VOLTAGE REGULATOR FOR A GENERATOR WITH FILTERED FEEDBACK MEANS

Rudi Stalp, Korntal, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany, a limited-liability company of Germany

Filed June 4, 1968, Ser. No. 734,459
Claims priority, application Germany, June 9, 1967, B 92,925
Int. Cl. H02p *9/30*
U.S. Cl. 322—28 **3 Claims**



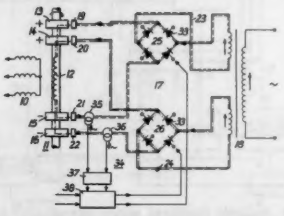
To enable use of integrated circuits, a field current transistor, being switched between conductive and blocked condition, controls the total supply of energy to the generator field; a control transistor is connected to the field current transistor to control its conduction, and a positive feedback circuit interconnects the two transistors for rapid on-off switching. The extent of conduction, as determined by the control transistor, depends on deviation of generator output voltage from a reference, for example a Zener diode. To prevent response of the control transistor to harmonics, a voltage divider with two taps is connected across the output, a capacitor being connected from one tap across the voltage divider to span another tap, and the reference voltage being taken off the other tap, so that the capacitor can act as a smoothing, or filtering capacitor, the resistance between the taps isolating the capacitor and the reference point of the voltage, and hence the feedback circuit, to provide for rapid response to output voltage variations.

3,560,841

EXCITER DEVICE TO TRANSFER HIGH EXCITATION CURRENTS BY MEANS OF BRANCH CIRCUITS AND PLURAL SLIP RINGS

Egon Pannen and Gerhard Lanz, Mulheim (Ruhr), Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed June 17, 1968, Ser. No. 737,485
Claims priority, application Germany, June 20, 1967, L 56,772
Int. Cl. H02k *13/02;* H02p *9/30*
U.S. Cl. 322—73 **4 Claims**



An exciter device for large alternators wherein direct excitation current is supplied from a stationary rectifier

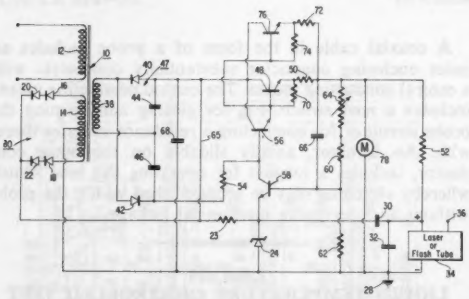
means having a plurality of separate current branch circuits to the inductor or field winding of the alternator, having opposite poles at its ends and provided with at least two slip rings at each pole. The slip rings at each pole are each electrically connected to a separate current branch circuit via their respective brushes and to each other via the inductor and all of the branch circuits are electrically connected to a current regulating device so that the current in each branch circuit is equalized.

3,560,842

SOLID STATE REGULATED POWER SUPPLY FOR INTERMITTENT LOADS WITH PLURAL CHARGING PATHS FOR A CAPACITOR

Fausto Caprari, Jersey City, N.J., assignor to RCA Corporation, a corporation of Delaware

Filed Dec. 26, 1968, Ser. No. 786,965
Int. Cl. G05f *1/64;* **H02m** *7/24*
U.S. Cl. 323—22 **6 Claims**



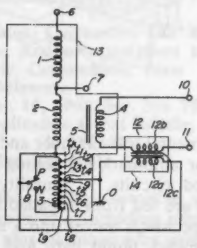
A voltage regulator for use with intermittent loads such as flash lamps which require high voltage pulses. The regulator supplies voltages which vary from a regulated maximum between flashes to substantially zero at the end of a flash. Since the voltage of the regulator goes substantially to zero at the end of the flash, rapid repetition of the flash is made possible.

3,560,843

TAPPED AUTOTRANSFORMER VOLTAGE REGULATOR WHEREIN AN AUXILIARY TRANSFORMER COMPENSATES FOR FLUCTUATING VOLTAGE

Kiyoshi Nakagawa, Yoshitake Kashima, and Teruo Fukuda, Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan, a corporation of Japan

Filed July 11, 1969, Ser. No. 840,951
Claims priority, application Japan, July 12, 1968, 43/48,491
Int. Cl. G05f *1/10;* **H02p** *13/06*
U.S. Cl. 323—43.5 **7 Claims**



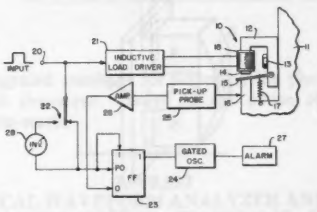
In an autotransformer having a tertiary winding and a tap winding, voltage regulation by means of the tap winding results in a wide variation of the voltage of the tertiary winding. In the present invention, a compensating transformer is provided on the side of the tertiary winding so as to thereby statically and automatically compensate for the variation in the voltage of the tertiary winding due to tap changing on the tap winding.

3,560,844

METHOD AND APPARATUS FOR MEASURING THE OPERATING-TIME OF AN ELECTROMAGNET, UTILIZING A PIEZOELECTRIC DEVICE

Vernon E. Brown, Cabot, Ark., assignor to Teletype Corporation, Skokie, Ill., a corporation of Delaware

Filed Oct. 14, 1968, Ser. No. 767,329
Int. Cl. G01r *31/02*
U.S. Cl. 324—28 **3 Claims**



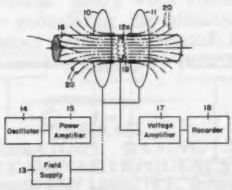
An operating-time measuring device for electromagnets of the type that drive an armature into engagement with a fixed stop includes a flip-flop that is set upon actuation of the magnet, a piegoelectric pickup probe responsive to vibrations caused by engagement of the armature of the electromagnet with the stop for producing a flip-flop resetting pulse, and a gated oscillator that is operated whenever the flip-flop is set for producing an alarm output if the flip-flop is not reset by the output of the piezoelectric probe within a predetermined time.

3,560,845

MEASURING DEVICES

Harold D. Goldberg, King St., Port Chester, N.Y. 10573, and Milton I. Goldberg, Barrett Road, Katonah, N.Y. 10536

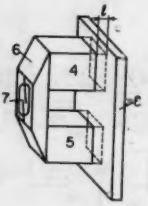
Continuation-in-part of application Ser. No. 4,766, Jan. 26, 1960, which is a continuation-in-part of applications Ser. No. 374,782, Aug. 17, 1953, and Ser. No. 374,868, Aug. 18, 1953, which in turn are continuations-in-part of application Ser. No. 66,523, Dec. 21, 1948. This application May 3, 1965, Ser. No. 456,885
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 **74 Claims**



A pickup device is disclosed which may be used with a magnetic field in a measuring system. The pickup device takes the form of a coil which, in use, is capable of conforming to a variety of shapes, and in certain forms is capable of following changes in said shapes without resistive force. This conformability of the coil is achieved

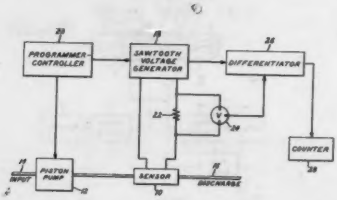
by a variety of coil arrangements including forms which allow the coil to deform without resistance and/or by mounting the coil on elastic or flexible supports, which supports conform to the various shapes. When the coil is positioned in a magnetic field it generates a signal which is a function of the particular shape or change in shape of the coil.

3,560,846
MAGNETIC PROXIMITY DETECTOR
Csaba Z. Bessko, 5806 Hobart St., Pittsburgh, Pa. 15217
Filed Oct. 8, 1968, Ser. No. 767,587
Int. Cl. G01r *33/00*
U.S. Cl. 324—41 **1 Claim**



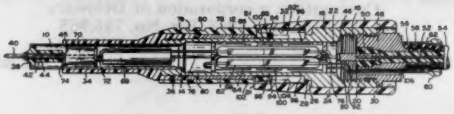
A device for detecting objects of magnetic permeable material or external magnetic flux is provided wherein one or more flux sources have opposite poles shunted by a yoke, of high permeability, which is not placed in saturation solely by those flux sources. An external object or flux source can saturate the yoke with resulting force on the device or flux surrounding the saturated yoke may be picked up by a sensor. Where two flux sources are shunted by a yoke and an air gap is between the other set of poles, a flux sensor near the yoke responds only to flux (such as due to a ferrous object) that effectively shortens the air gap and exceeds that which saturates the yoke. The sharply saturable yoke gives the device definite pull-in and drop-out characteristics. The air gap configuration provides directional sensitivity.

3,560,847
APPARATUS AND PROCESS FOR DETECTING LIVE BACTERIA
Joseph W. Boyd, Devon, and Myron H. Bengson, King of Prussia, Pa., assignors to General Electric Company, a corporation of New York
Filed Apr. 19, 1968, Ser. No. 722,780
Int. Cl. G01n *27/00*
U.S. Cl. 324—71 **8 Claims**



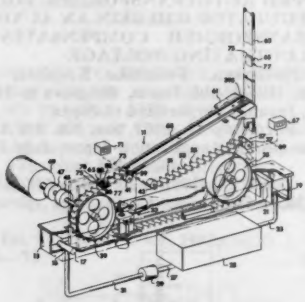
Process and apparatus for detecting the presence of live bacteria in a fluid involves establishing, in a non-moving portion of the fluid, a current path, at least a segment of which is restricted in cross sectional area, increasing the electrical potential along the restricted current path and measuring any sudden resistance change in the restricted current path responsive to the presence therein of live bacteria.

3,560,848
SWITCHABLE COAXIAL PROBE MEMBER UTILIZING A REED SWITCH
Marlow D. Butler, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg., a corporation of Oregon
Filed May 20, 1968, Ser. No. 730,538
Int. Cl. G01r *31/02*
U.S. Cl. 324—72.5 **11 Claims**



A coaxial cable in the form of a probe includes an outer enclosing conductor substantially concentric with a central conducting means. The central conducting means includes a reed switch, e.g. for closing and opening the probe circuit or for connecting a resistance in series therewith. An actuator, axially slidable on the outer conductor, includes a magnet for operating the reed switch whereby switching may be accomplished within the probe without an intervening mechanical linkage.

3,560,849
LIQUID TEMPERATURE CONTROLLED TEST CHAMBER AND TRANSPORT APPARATUS FOR ELECTRICAL CIRCUIT ASSEMBLIES
Robert B. Ryan, Timonium, August A. Zachmeier, Joppa, and Hans D. Heyck, Phoenix, Md., and Robert E. Garman, York, Pa., assignors to AAI Corporation, Cockeysville, Md., a corporation of Maryland
Filed Aug. 15, 1967, Ser. No. 660,673
Int. Cl. G01r *15/12*
U.S. Cl. 324—73 **27 Claims**



An environmental test chamber and transport apparatus is disclosed for automatically testing a plurality of packaged integrated circuits. A plurality of packaged integrated circuits are fed from a loaded input magazine onto a transport tape which moves into a non-conductive, temperature controlled, liquid bath and then into a test assembly which is submerged in the bath. As each packaged integrated circuit moves into the test assembly, its presence is detected and, when it is properly positioned, movement of the transport tape is stopped. Next, the particular

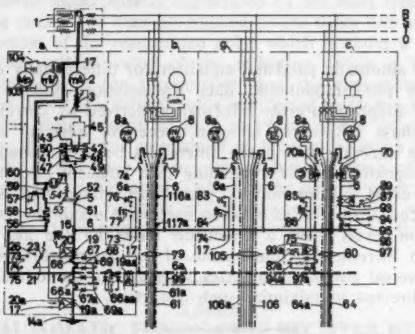
packaged integrated circuit in the test assembly is removed from the transport tape and pressed against a test socket having a plurality of protruding contacts which engage the exposed terminals of the packaged integrated circuit whereupon a series of programmed tests are performed to determine the electrical characteristics of the packaged integrated circuits. When the tests are completed, the packaged integrated circuit is placed back on the transport tape whereupon movement of the transport tape again commences which carries the packaged integrated circuits out of the bath and feeds them into an output magazine.

3,560,850

SYSTEMS FOR DETECTING AND LOCATING BEGINNING FAULTS IN ENERGIZED ELECTRIC NETWORKS

Elof A. B. Hojding, Vapengatan 9, S–12652, Hagersten, Stockholm, Sweden

Filed June 26, 1968, Ser. No. 740,332
Int. Cl. G01r *31/08*
U.S. Cl. 324—52 **10 Claims**



Ground fault or insulation fault and joint continuity faults electrical detecting devices for large, extended plants and installations. Detecting localizing and continuously supervising devices extending over both ungrounded and grounded A.C. as well as D.C. systems having further current carrying zero wires. A system for detecting and locating disturbance sources or faults in the running of a plant and in the surroundings before the faults have grown or advanced into injuries, by making use of protective conductor circuits of the live electric networks of the plant.

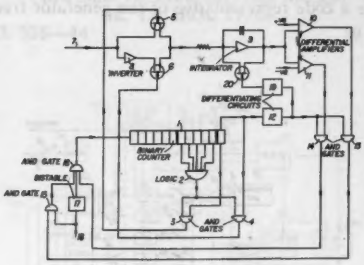
3,560,851

PHASE-SENSITIVE DETECTOR HAVING MEANS FOR SYNTHESIZING A SINE WAVE PLUS HARMONICS

Brian Ronald Gaines, Colchester, and Raymond Allan Shemer, Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y., a corporation of Delaware

Filed Sept. 10, 1968, Ser. No. 758,909
Claims priority, application Great Britain, Sept. 21, 1967, 42,931/67
Int. Cl. G01r *23/16*
U.S. Cl. 324—77 **5 Claims**

There is provided a phase-sensitive detector for a simple harmonic waveform including means for synthesizing a sine-wave plus harmonics by generating a pulse train in which the pulses are effectively weighted —E, O+E and in which the pulse clock rate, number of pulses and pulse distribution are so arranged that the amplitudes of selected harmonics in the synthesized sine-wave are minimized, means for multipying the incoming sine-wave with the synthesized sine-wave, means for integrating the resultant and means responsive to the value



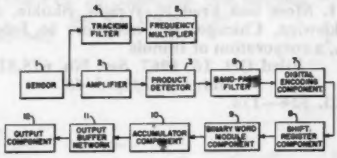
of the integrated resultant for adjusting the phase of the synthesized sine-wave relative to the phase of the incoming sine-wave.

3,560,852

ELECTRICAL WAVEFORM ANALYZER AND DATA TABULATION SYSTEM COMBINING DIGITAL AND MULTIPLEXING TECHNIQUES

Lawrence B. Haskin and Joseph P. Hesler, Liverpool, N.Y., and Larry R. Last, Cincinnati, and Charles J. Smith, West Chester, Ohio, assignors to General Electric Company, a corporation of New York

Filed Sept. 30, 1968, Ser. No. 763,902
Int. Cl. G01r *23/16*
U.S. Cl. 324—77 **9 Claims**



A system for analyzing analog electrical waveforms of relatively high complexity in amplitude and frequency employing digital techniques for tabulating certain data derived from the waveforms, which data can be employed to categorize said waveforms. Within selected bands of the input frequency spectrum, the input analog signal is digitally encoded and through multiplexing a tabulation is made of particular binary word characteristics. By means of further multiplexing, the tabulated data is read out to suitable output means. An important application of the system is to rotating machinery noise and vibration analysis.

3,560,853

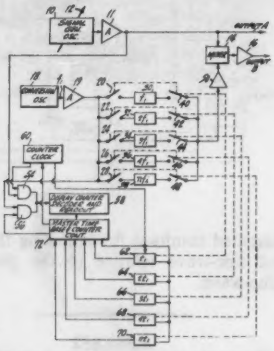
SIGNAL GENERATORS HAVING EXTENDED DISPLAYABLE SIGNAL FREQUENCY RANGES

Edmund I. Schwartz, Fair Lawn, N.J., assignor to Sland/Fin Corporation, a corporation of New York

Filed Sept. 26, 1968, Ser. No. 762,800
Int. Cl. G01r *23/14*
U.S. Cl. 324—79 **11 Claims**

A signal generator capable of being tuned over a wide range of frequencies, has this effective range shifted to a higher range by means of a mixer and a conversion oscillator, for providing a sum frequency at the mixer output equal to that of the signal generator frequency and the

conversion oscillator signal frequency. A frequency counting circuit, having a limited input frequency response characteristic, is controlled by selectable timing circuitry, which sequentially applies the generator frequency signal to the counting circuit to cause the counting circuit to provide a code representative of the generator frequency.



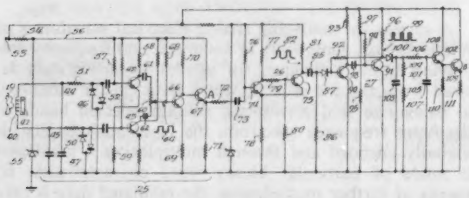
The timing circuitry then applies the conversion oscillator signal to the counting circuit to cause the counter to accumulate a second code which with the first code represents the sum frequency provided at the mixer output and which frequency exceeds the limited input frequency response of the counting circuit.

3,560,854

PULSE ACTUATED SPEED RESPONSIVE SYSTEM

John I. Moss and Fred R. Wright, Skokie, and Walter Jaskiewicz, Chicago, Ill., assignors to John I. Moss, Inc., a corporation of Illinois

Filed Oct. 16, 1967, Ser. No. 675,511
Int. Cl. G01p *3/48*
U.S. Cl. 324—174 **6 Claims**



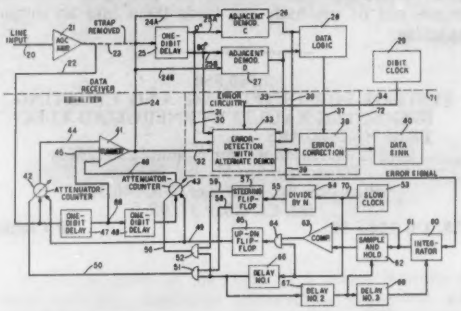
A system which converts speed related pulses developed in a magnetic pickup to a variable amplitude DC voltage to control speed responsive functions. A noise filter, trigger and monostable multivibrator eliminate interference and produce pulses of uniform shape and at a frequency the same as (or directly related to) the frequency of pulses from the pickup. The produced pulses are rectified to establish a DC voltage having an amplitude directly related to speed. Function detectors respond to different levels of the DC voltage to operate relays indicative of the measured speed. The DC voltage controls the timing ratio of a variable rectangular wave generator, the output of which operates the control valve of a hydraulic speed regulator.

3,560,855

AUTOMATIC EQUALIZER UTILIZING ERROR CONTROL INFORMATION

Henry C. Schroeder, East Brunswick, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed June 7, 1968, Ser. No. 735,444
Int. Cl. H04b *3/14*
U.S. Cl. 325—30 **9 Claims**



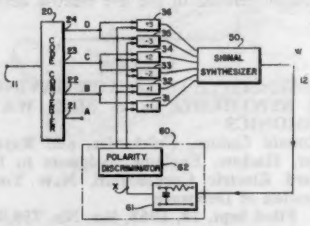
An automatic passband equalizer for differentially coherent phase-modulation data transmission systems is made adaptive to error information derived by correlating phase differences between successive adjacent signaling intervals with phase differences between nonadjacent signaling intervals spanning such adjacent intervals. The error information is periodically integrated and quenched. Differences between successive maximum integration levels yield a distortion index by the aid of which incremental adjustments of tap attenuators in a transversal equalizer in series with a data demodulator are directed to minimize such distortion.

3,560,856

MULTILEVEL SIGNAL TRANSMISSION SYSTEM

Hisashi Kaneko, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan, a corporation of Japan

Filed Dec. 26, 1967, Ser. No. 693,499
Claims priority, application Japan, Dec. 29, 1966, 42/964
Int. Cl. H03k *7/00*
U.S. Cl. 325—38 **5 Claims**



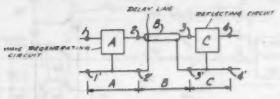
A system for transmitting a multilevel signal representative of a binary signal input including a converter for changing the input to a quaternary output code, pulse generator means for the respective quaternary code elements which feed their outputs to a signal synthesizer, and a switching pulse generator connected between the output of the signal synthesizer and the inputs of the pulse generators.

3,560,857

PULSE REGENERATING REPEATER

Tsuneo Nakahara, Yasuo Shimizu, and Yuji Kosaka, Nishinomiya, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan, a company of Japan

Filed Aug. 24, 1966, Ser. No. 574,764
Claims priority, application Japan, Aug. 25, 1965, 40/51,792
Int. Cl. H04b *3/58*
U.S. Cl. 325—38 12 Claims



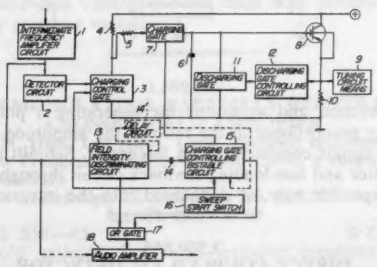
A pulse regenerating repeater to be installed in cascade in a transmission line to regenerate attenuated pulses wherein the repeater consists of a series connection of a wave regenerating circuit, a delay line and a reflecting circuit respectively. An attenuated and phase jittered input pulse is regenerated by the wave regenerating circuit and then propagated on the delay line and the portion of the regenerated pulse which is above a preselected critical value of the reflecting circuit is passed therethrough for transmission and the remaining portion below this critical value is reflected to form a timing pulse which is shuttled back and forth on the delay line. The simultaneous presence of an input pulse and a timing pulse at the wave regenerating circuit triggers a negative resistance device therein, whereby the pulse is regenerated such that the retiming of the regenerated pulse is controlled at the original fundamental frequency by the timing pulse.

3,560,858

AUTOMATIC TUNING TYPE RECEIVER WITH FREQUENCY HOLDING CIRCUIT

Yasuhide Sakai, Kawasaki-shi, and Yoshinori Takagi and Masahiro Watanabe, Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan, a corporation of Japan

Filed July 5, 1968, Ser. No. 742,673
Claims priority, application Japan, July 11, 1967, 42/45,171; July 14, 1967, 42/46,000; July 24, 1967, 42/48,046; Dec. 15, 1967, 42/81,347; Apr. 9, 1968, 43/24,178
Int. Cl. H04b *1/32*
U.S. Cl. 325—470 7 Claims



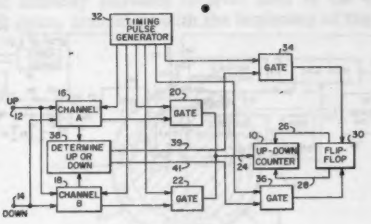
An automatic tuning type receiver using variable reactance elements of which the reactance value is electronically varied in accordance with a voltage or current supplied thereto, thereby making it possible to positively effect the frequency sweep and sustain the tuned state.

3,560,859

SYNCHRONOUS ANTICOINCIDENCE GATE

Francis T. Thompson, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed June 19, 1968, Ser. No. 738,236
Int. Cl. H03k *21/06*
U.S. Cl. 328—44 10 Claims



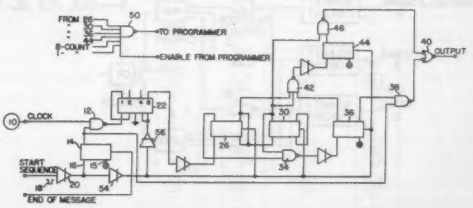
Described is an anticoincidence gate for application with up-down counters and the like and which cancels overlapping input signals of opposite direction (i.e., up and down count pulses occurring at the same time). This is accomplished by the use of two channels employing NAND logic elements, one of said channels acting to receive and store a pulse while the other feeds a pulse to the counter or other device and vice versa.

3,560,860

PULSE GENERATOR OF SPECIAL SIGNAL FOR SYNCHRONIZING RECEIVERS OF MASTER-REMOTE SYSTEM

Klaus Gueldenpfennig, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y., a corporation of Delaware

Filed Feb. 20, 1969, Ser. No. 801,068
Int. Cl. H03k *1/00*
U.S. Cl. 328—63 1 Claim



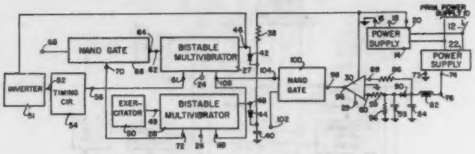
A circuit for generating a special signal for synchronizing the receivers of a master-remote system of the kind used for the supervision and control of apparatus from a remote location, and in which the information signals used for supervision and control consist of trains of electrical pulses, all the pulses of each train being of the same length. Two special pulses are transmitted for synchronization just prior to the start of each train of information pulses. The special pulses are of predetermined polarity, and are each one and one-half times as long as the information pulses. The circuit uses a counter and a series of flip-flops and gates to produce the desired synchronizing signals, and also to define the proper durations of the information pulses. In addition, a gate arrangement is used to produce a special START DATA pulse at a predetermined time after the synchronizing pulses are completed.

3,560,861

ELECTRONIC SENSING SYSTEM FOR SELECTIVELY ENERGIZING AND DE-ENERGIZING APPARATUS

William Milleker and Ronald J. Sekula, Chicago, Ill., assignors to Motorola, Inc., Franklin Park, Ill., a corporation of Illinois

Filed Jan. 16, 1969, Ser. No. 791,555
Int. Cl. H03k 17/28
U.S. Cl. 328—74 6 Claims



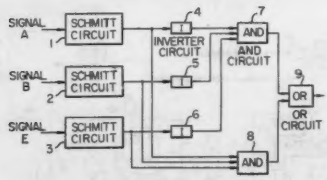
The electronic sensing system selectively energizes an electrical apparatus a predetermined time after the electrical power is applied to the system and in synchronism with a signal indicating the apparatus is ready to be energized. The electrical apparatus is de-energized in response to both a sudden decrease in amplitude of a monitored voltage which activates a trigger circuit, and in synchronism with a subsequent signal indicating the apparatus is ready to be de-energized. A sensing circuit compares the voltage being monitored with a reference derived from this voltage to activate the trigger circuit.

3,560,862

SYSTEM FOR DETECTING THE MALFUNCTION IN A DETECTING DEVICE OF A DISPLACEMENT

Shin-Ichi Kamachi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1968, Ser. No. 778,622
Int. Cl. H03b 3/04
U.S. Cl. 328—92 5 Claims



System for detecting the malfunction in a measuring device of a displacement utilizing at least one cyclically varying signal having a first and second sign in each cycle thereof and produced in response to the displacement to be measured comprising the steps of detecting three cyclically varying signals including the first mentioned at least one cyclically varying signal each having the same cyclic period but their phases shifted relatively from each other, and detecting two conditions among the eight conditions in the combination of the first or second sign in the three signals.

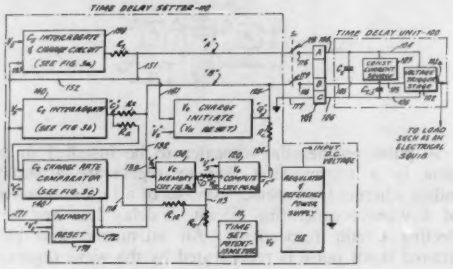
The above described two conditions will never appear in the normal function of the three signals in response to the displacement while the six other conditions in the combination will necessarily take place during the normal function of the signals, thereby permitting the malfunction of the signals to be positively detected by inspecting the occurrence of the above described two conditions.

3,560,863

SETTABLE TIMER FOR SELECTIVELY DETERMINING THE DELAY EXHIBITED BY A TIME DELAY UNIT HAVING A CHARACTERISTIC DELAY SUBJECT TO VARIATION

Joseph Baumoel, Jericho, N.Y., assignor to Controlotron Corporation, Farmingdale, N.Y., a corporation of New York

Filed Apr. 10, 1968, Ser. No. 720,110
Int. Cl. G01r 29/02; H03k 5/00
U.S. Cl. 328—129 12 Claims



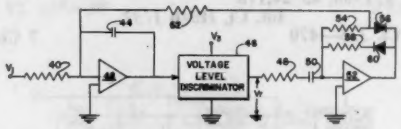
An electronic time delay device is combined with a time delay setter in a manner such that the time delay period begins upon the physical separation of the time delay device from the setter. The time delay setter includes means for automatically determining the parameters of the electrical elements of the time delay device and means for compensating for the variations in the electronic time delay device from predetermined reference characteristics.

3,560,864

VOLTAGE TO PULSE FREQUENCY CONVERTER

Hendrikus J. Nihof, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y., a corporation of Delaware

Filed Nov. 24, 1967, Ser. No. 685,595
Claims priority, application Netherlands, Dec. 12, 1966, 6617415
Int. Cl. G06g 7/16
U.S. Cl. 328—161 3 Claims



A method and apparatus for generating a pulse frequency proportional to the ratio of the amplitude of two input signals consisting of an integrator, Schmitt trigger, capacitor and non-loading feedback circuit through which the capacitor may be discharged into the integrator.

3,560,865

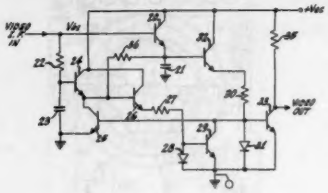
DIRECT COUPLED AM DETECTOR

Jack R. Harford, Three Bridges, N.J., assignor to RCA Corporation, a corporation of Delaware

Filed Mar. 3, 1969, Ser. No. 803,920
Int. Cl. H03d 1/18; H04b 1/16; H04n 5/44
U.S. Cl. 329—101 12 Claims

An amplitude modulation detector circuit employs a rectifier coupled to a source of signal modulated carrier waves containing a direct voltage component not related

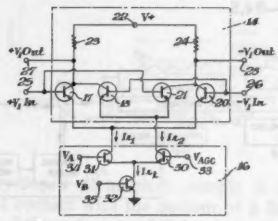
to the modulation components of the carrier wave. The direct voltage component is monitored by a circuit, which also includes a rectifier, to derive a voltage for maintaining a stable low current bias through the detector amplifier. The rectifier in the monitoring circuit is returned to a point of reference potential by a transistor whose impedance is controlled as an inverse function of the detected signal.



3,560,866
IF AMPLIFIER WITH COMPENSATED TRANSISTOR UNIT

George W. Haines, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass., a corporation of Massachusetts

Continuation-in-part of application Ser. No. 551,341, May 19, 1966. This application Aug. 20, 1968, Ser. No. 753,940
Int. Cl. H03b 1/14
U.S. Cl. 330—27 **5 Claims**



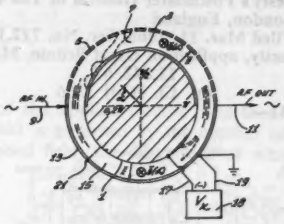
An integrated bridge network of two transistor pairs is used as the active device in a tuned differential IF amplifier stage. The transistors are so fabricated and interconnected as to provide neutralization of the internal collector-to-base capacitive feedback. Variations of the relative bias current levels of the transistor pair produce automatic gain control for the stage with minimal frequency response variations.

3,560,867
SELF-MODULATING, PARTIALLY REENTRANT CROSSED FIELD AMPLIFIER

Philip N. Hess, Los Altos, Calif., assignor to Litton Precision Products, Inc., San Carlos, Calif., a corporation of Delaware

Filed Apr. 22, 1969, Ser. No. 818,279
Int. Cl. H03f 3/58
U.S. Cl. 330—43 **6 Claims**

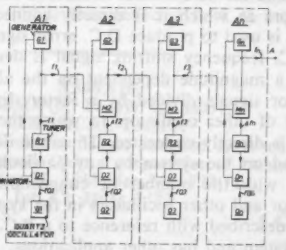
A cold cathode distributed emission reentrant type crossed field amplifier is provided which possesses electrical efficiencies approaching that available in the reentrant type crossed field amplifiers of the prior art but which features the simplicity of the non-reentrant type crossed field amplifier. A circular configuration is used for the tube; one in which the beginning and end of the interaction region is connected with the drift space region, so as to form a complete annular passage abou the sole and cathode. The magnetic structure produces a magnetic field at the programmed level, which may be constant, in the interaction region and in addition provides a variation in the drift space. At the entrance to the drift space the magnetic intensity decreases as a function of position along the length of the drift space from the programmed level, gradually, over a predetermined length of the drift space to a second lower predetermined intensity. Along the remaining length of the drift space the field intensity increases in level until at the end of the drift space, coincident with the beginning of the interaction region, the magnetic field intensity is again at the programmed level. The tapering of the magnetic field in the drift space region is designed so that it diverts significant amounts of those electrons that pass through the interaction region and enter the drift space region. Hence, the remaining electrons which reenter the interaction region are insufficient in quantity or energy to cause self-oscillation after the RF drive signal has been removed.



3,560,868
HIGH RESOLUTION TUNING OVER A WIDE FREQUENCY RANGE

Helmut Oberbeck, Backnang, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm, Danube, Germany

Filed Sept. 19, 1968, Ser. No. 760,846
Claims priority, application Germany, Sept. 22, 1967, P 15 91 722.3
Int. Cl. H03b 3/04
U.S. Cl. 331—2 **5 Claims**



A method and apparatus for accurately tuning the frequency of a generated signal by coarse tuning the output of a generator in a first stage and providing a plurality of further tuning stages each arranged to effect a finer tuning than the preceding stage, each further stage being arranged to generate a signal, to mix that signal with the signal from the preceding stage to produce an output whose frequency is equal to the difference between the frequencies of the two mixed signals, frequency dividing the difference signal by means of a variable digital counter which is controlled to have any one of a plurality of frequency division ratios, comparing the frequency of the counter output with a reference frequency derived from a quartz oscillator, producing a control signal which

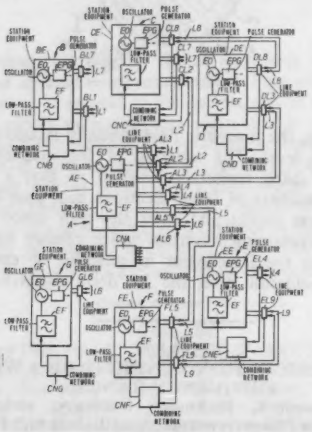
is proportional to the difference between the compared frequencies, and applying this control signal to the generator of the associated stage to bring the output frequency of the generator to a value which will cause the counter output frequency to be equal to the reference frequency, the output from the system being taken from the generator of the last further stage.

3,560,869

FREQUENCY CONTROL OF OSCILLATORS

Michael Robert Miller, Watford, England, assignor to Her Majesty's Postmaster General of The General Post Office, London, England

Filed Mar. 11, 1968, Ser. No. 712,130
Claims priority, application Great Britain, Mar. 14, 1967, 11,842/67
Int. Cl. H04j *3/06*
U.S. Cl. 331—2 **9 Claims**



A means for controlling the operating frequencies of an interconnected system of oscillators. Frequency control of each oscillator is effected by application of D.C. signals derived from comparison between the operating frequencies of the oscillator concerned and the respective oscillators to which it is directly connected. The comparison is used to produce D.C. error signals from which the D.C. frequency shifting signal is derived, the latter having a magnitude dependent on the algebraic sum of the error signals divided by a factor dependent on the number of other oscillators to which the oscillator concerned is directly connected. Thus, the degree of control exercised on the system by any particular oscillator increases with the number of connections between that oscillator and other oscillators in the system. The invention is described with reference to a P.C.M. communications system and has other applications.

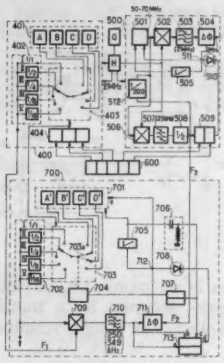
3,560,870

FREQUENCY SYNTHESIZER

Lucien Babany, Blanc-Mesnil, and Michel Marchal, Paris, France, assignors to C.I.T.-Compagnie Industrielle des Telecommunications, Paris, France, a corporation of France

Filed Dec. 2, 1968, Ser. No. 787,290
Claims priority, application France, Nov. 30, 1967, 130,483
Int. Cl. H03b *3/04*
U.S. Cl. 331—4 **14 Claims**

Device for frequency interpolation with fine quantization steps (for example 1 kc.) in the output spectrum of a first wide band wide-stepped synthesizer (for example 100 kc.), essentially comprising a second low-frequency synthesizer controlled by the lowest order decades of the control box serving to indicate the desired frequency, and



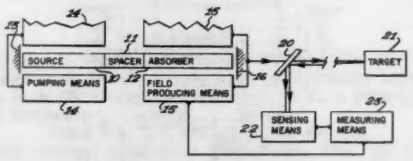
an auxiliary high-frequency synthesizer supplying a frequency which is the sum of the frequencies supplied by the first and second synthesizers.

3,560,871

FIELD RESPONSIVE ABSORBER FOR Q-SPOILING A LASER

Di Chen, Hopkins, Minn., assignor to Honeywell, Inc., a corporation of Delaware

Filed Feb. 27, 1964, Ser. No. 347,934
Int. Cl. H01s *3/10*
U.S. Cl. 331—94.5 **6 Claims**



Apparatus for Q-spoiling a maser utilizing either the Zeeman or Stark effect. Included within an optical cavity defined by two reflective surfaces are a maser region, an absorber region and a reflection eliminating spacer between the maser and absorber regions. A high population inversion is achieved by applying a varying field to the absorber region, whereby the absorption spectrum of the absorber region is super-imposed on the emission spectrum of the maser region. After a high population inversion is achieved, the absorption spectrum of the absorber region is shifted by either the Zeeman or Stark effect. The absorber region is then transparent to the maser region's emission frequency, whereby the optical cavity defined by the two reflective surfaces resonates producing a large output pulse.

3,560,872

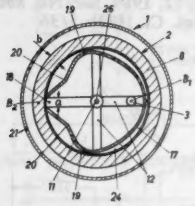
OPTICAL SOLID BODY LIGHT AMPLIFIER

Conrad Heimann, Bad Godesberg, Germany, assignor to Ringsdorff-Werke G.m.b.H., Bad Godesberg-Mehlem, Germany, a corporation of Germany

Filed Feb. 10, 1966, Ser. No. 526,552
Claims priority, application Germany, May 7, 1965, R 40,568
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **17 Claims**

A solid-state laser having a plurality of closely spaced and successive elongate portions of selectively fluorescent

material defining a body element with polished and reflective opposite longitudinal ends. Means are provided for supporting the body element for rotation about an axis of rotation past a source of excitation light so that



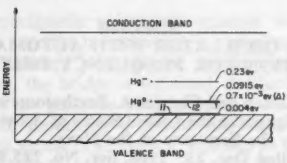
an internal reflection between the reflective longitudinal ends is initiated to thereby result in the production of a monochromatic coherent light in a direction longitudinally of the successive elongate portions.

3,560,873

LASER HAVING A POPULATION INVERSION BETWEEN STATES OF A MERCURY DOPANT IN A GERMANIUM SAMPLE

Richard A. Chapman, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex., a corporation of Delaware

Filed July 5, 1967, Ser. No. 651,259
Int. Cl. H01s *3/18*
U.S. Cl. 331—94.5 **4 Claims**



A mercury-doped germanium sample is mounted in close thermal contact with the bottom of a liquid helium filled Dewar. Infrared transmitting windows such as potassium bromide are provided in the Dewar to permit pumping and lasing radiation to pass into and out of said Dewar. The mercury-doped germanium has a split ground state with the upper split off state being depopulated by cooling the sample to about 5° K. A population inversion between the split off ground state and the effective mass excited states of the mercury-doped germanium sample can be obtained by infrared pumping using a CO_2 laser beam which has a wavelength of about 10.6 microns and photon energies of 117 millielectron volts. Since ground states binding energy of the mercury impurity is about 91.5 millielectron volts, thermal heating of the sample is minimized by using a CO_2 laser since the excess kinetic energy of the photo-generated carrier is on the order of 26 millielectron volts.

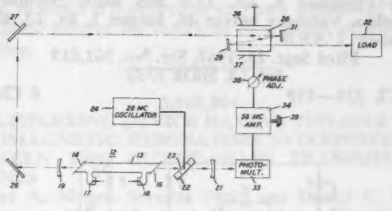
3,560,874

VARIABLE OPTICAL FREQUENCY SHIFTER

Michel A. Duguay, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J., a corporation of New York

Filed Oct. 12, 1966, Ser. No. 586,153
Int. Cl. H01s *3/10*
U.S. Cl. 331—94.5 **6 Claims**

The optical frequency of a coherent optical pulse train is shifted by means of an electro-optic crystal to which is applied a sinusoidal electric field synchronized in frequency (with the pulse repetition rate) and phase with the pulse train. The phase is adjusted such that refraction index of the crystal is changing at its fastest rate when a pulse transverses the crystal. The change in index of refraction of the crystal is directly proportional to the



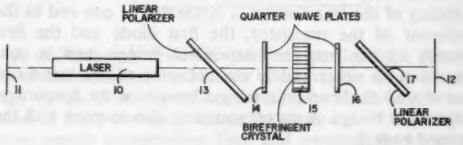
magnitude of the applied electric field, hence the total frequency shift is governed by the number of reflections and the applied field, the magnitude of which is made controllable.

3,560,875

BEAM ANGLE LIMITER

John A. Macken, Orange, Calif., assignor to North American Rockwell Corporation

Filed Sept. 11, 1967, Ser. No. 66,629
Int. Cl. H01s *3/00*; G02b *5/30*
U.S. Cl. 331—94.5 **5 Claims**



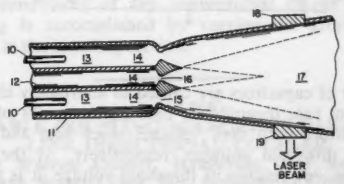
The light emitted from a laser is first passed through a linear polarizer and then through a quarter-wave plate to produce circularly polarized light. The circularly polarized light is then transmitted through a birefringent crystal, which may be either uniaxial or biaxial, with the optic axis of the crystal positioned substantially parallel to the light beam. The light emergent from the crystal passes through a second quarter-wave plate and through a second polarizer and is then reflected back through the system.

3,560,876

SUPERSONIC FLOW GASEOUS CHEMICAL LASER

John R. Airey, Woburn, Mass., assignor to Avco Corporation, Cincinnati, Ohio, a corporation of Delaware

Filed May 31, 1968, Ser. No. 733,714
Int. Cl. H01s *3/22*
U.S. Cl. 331—94.5 **6 Claims**



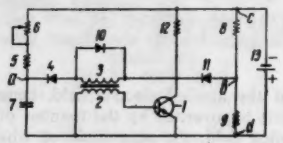
A CW gaseous chemical laser wherein a plurality of suitable gases are expanded from a high pressure high temperature reservoir and mixed at supersonic velocities. Mixing and reaction take place in the supersonic flow to produce laser action.

3,560,877

TRANSISTORIZED BLOCKING OSCILLATOR WITH BRIDGE RC TIME SETTING CIRCUITS

Viktor Alexandrovich Ilin, Ulitsa Gorkogo 6, korpus 5, kv. 330; Vladimir Alexandrovich Shpolyansky, Ulitsa Lizy chaikinoi 6, kv. 113; and Boris Nicolaevich Konshin, Volzhsky bulvar 46, korpus 1, kv. 23, all of Moscow, U.S.S.R.

Filed Sept. 23, 1968, Ser. No. 761,619
Int. Cl. H03k 3/30
U.S. Cl. 331—110 4 Claims



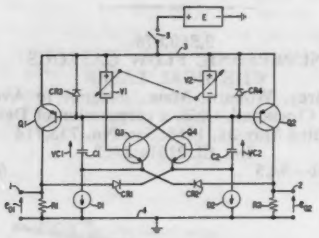
A blocking oscillator is provided with a transformer having a primary and secondary winding, a transistor having a base, emitter and collector, a frequency-dependent bridge having a first and a second branch, and first and second diodes. The first branch includes a capacitor and a resistor, and the second branch includes two resistors. The primary winding of the transformer is connected to the base and emitter of the transistor. The secondary winding of the transformer is connected at one end to the collector of the transistor, the first diode and the first branch of the frequency-dependent bridge, and is connected at its other end to the collector of the transistor, the second diode and the second branch of the frequency-dependent bridge. A power source is also coupled with the second branch.

3,560,878

CONSTANT FREQUENCY AMPLITUDE-TO-PULSE WIDTH CONVERTER

Noble E. Wickliff, Winston-Salem, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J., a corporation of New York

Filed June 27, 1968, Ser. No. 740,747
Int. Cl. H03k 3/282
U.S. Cl. 331—113 5 Claims



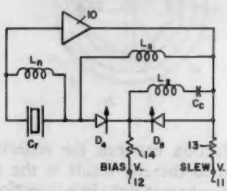
A pair of capacitors are caused to alternately charge at a constant rate through the base-emitter paths of a pair of transistors until their voltages reach first and second variable threshold voltages, respectively. At the instant each capacitor reaches its threshold voltage, it is abruptly discharged and the other capacitor starts to charge. Rectangular voltage waveforms of opposite phase appear across resistors in the collector circuits of the transistors. The widths of the pulses in the waveforms are controlled by the threshold voltages. By maintaining the sum of the threshold voltages constant, the frequency of the waveforms will be constant regardless of pulse width.

3,560,879

LINEAR VOLTAGE CONTROLLED CRYSTAL OSCILLATORS

James A. Fuchs, Palo Alto, Calif., assignor, by mesne assignments, to the United States of America as represented by the Secretary of the Navy

Filed Mar. 12, 1969, Ser. No. 806,641
Int. Cl. H03b 5/36
U.S. Cl. 331—116 5 Claims



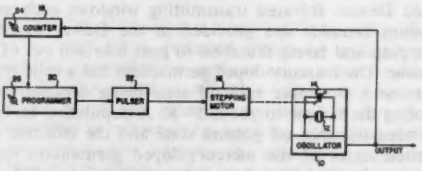
A linear voltage controlled crystal oscillator having an amplifier variable voltage feedback circuit with inductors, capacitors, and varactors producing a varactor network in series with a crystal and inductance network that provide circuit oscillation where the phase shift through the feedback circuit is zero, or at a frequency where the reactance of the inductance-capacitance network cancels the reactance of the crystal network, which varactor network is easy to align to provide a linear reactance-voltage relation.

3,560,880

CRYSTAL OSCILLATOR WITH AUTOMATIC COMPENSATION FOR FREQUENCY DRIFT DUE TO AGING

Roger L. Easton and Charles A. Bartholomew, Oxon Hill, Md., assignors to the United States of America as represented by the Secretary of the Navy

Filed Dec. 23, 1968, Ser. No. 785,883
Int. Cl. H03b 3/04, 5/32
U.S. Cl. 331—158 6 Claims



A highly stable crystal oscillator for keeping time precisely wherein the frequency drift due to aging of a quartz crystal is compensated by a programmed electromechanical tuning device.

3,560,881

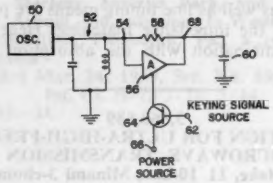
TRANSISTOR-KEYED CIRCUIT FOR TRANSIENT-FREE FREQUENCY SHIFT KEYING

Bo G. Fredricsson, San Francisco, Calif., assignor to Lynch Communication Systems, Inc., San Francisco, Calif., a corporation of Delaware

Filed Nov. 18, 1968, Ser. No. 776,670
Int. Cl. H03b 3/00
U.S. Cl. 331—179 1 Claim

In frequency-shift keying a signal with a transistor keying device, phase shift at the instant of keying is avoided by connecting, in parallel with the oscillator tank circuit, a reactance in series with a parallel-connected resistor-

and-unity-gain-amplifier combination so that energization of the unity gain amplifier prevents current flow through



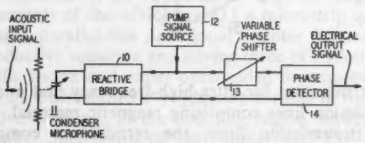
the resistor without physically disconnecting it from the circuit.

3,560,882

PARAMETRIC ACOUSTIC WAVE SENSOR

Henry R. Beurrier, Chester Township, Morris County, and Harold Seidel, Warren, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J., a corporation of New York

Filed Aug. 25, 1969, Ser. No. 852,795
Int. Cl. H03c *1/46*
U.S. Cl. 332—2 **6 Claims**



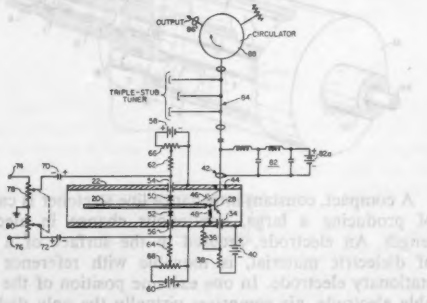
An electromagnetic parametric acoustic wave sensor comprising a reactive bridge which is energized by means of a high frequency pump signal. In the absence of an acoustic wave, the bridge is balanced, producing no output signal. In the presence of an acoustic wave the bridge is unbalanced, producing a double sideband, suppressed carrier output signal. The latter is coupled to a phase detector, along with a component of pump signal, wherein an electrical replica of the acoustic input signal is produced.

3,560,883

FREQUENCY CONTROL OF A MICROWAVE DEVICE USING A TRANSMISSION LINE AS A FREQUENCY DETERMINING ELEMENT

Robert G. Rogers, Los Altos, Calif., assignor to Automatic Electric Laboratories, Inc., Northlake, Ill., a corporation of Delaware

Filed Aug. 13, 1968, Ser. No. 752,339
Int. Cl. H03b *7/14;* **H03c** *3/22*
U.S. Cl. 332—16 **18 Claims**



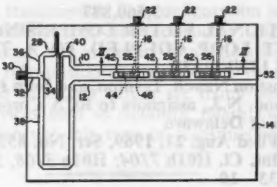
A transistorized microwave oscillator having a distributed constant transmission line as its primary frequency determining element, is electrically tuned by varying the resistance of at least one variable conductance device positioned near a voltage null on the transmission line. The disclosed null tuning has particular application in oscillators because of its capability of producing substantially linear frequency modulation, but may be used in other applications, for example in electrically tuned filters, in which it is desired to vary as a function of signal voltage or current the reactance of a length of transmission line.

3,560,884

MULTIPLEXING DEVICE HAVING TUNABLE FERROMAGNETIC RESONATORS INTERPOSED BETWEEN TWO OUT-OF-PHASE TRANSMISSION LINES

Robert A. Moore, Severna Park, and Daniel C. Buck, Hanover, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Apr. 16, 1969, Ser. No. 816,753
Int. Cl. H03h *7/10;* **H01p** *5/12*
U.S. Cl. 333—6 **5 Claims**



A multiplexing device is disclosed employing a plurality of ferromagnetic resonators which couple all wave energy within their respective operating bands from a broad band of wave energy propagating along a pair of parallel wave energy transmission lines and transmit the coupled energy to associated secondary wave energy transmission lines positioned adjacent each of the resonators.

3,560,885

VARIABLE RADIO-FREQUENCY COUPLER

Gene Chao, Menlo Park, Calif., assignor to Textron Inc., Belmont, Calif., a corporation of Rhode Island

Filed Nov. 18, 1968, Ser. No. 776,372
Int. Cl. H01p *5/14*
U.S. Cl. 333—10 **6 Claims**

The invention is a variable radio-frequency, quarter-wave, TEM mode coupler with parallel ground planes and center conductors of any conventional shape. Variable coupling is accomplished by varying the ground-plane spacing in the coupling section.

3,560,886

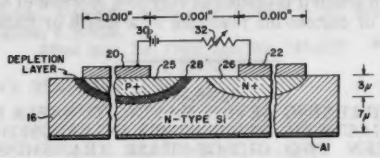
VARIABLE COUPLING MICROSTRIP PARALLEL-LINE DIRECTIONAL COUPLER

Herbert Warren Cooper, Hyattsville, and Robert Q. Macleay, Severna Park, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Mar. 24, 1969, Ser. No. 809,669
Int. Cl. H01l *3/00;* **H01p** *5/14*
U.S. Cl. 333—10 **7 Claims**

Described is a novel variable coupling, directional coupler employing microstrip transmission lines on a

semiconductive substrate. Variable coupling is achieved by the provision of a distributed P-N junction in the coupling region of the semiconductive substrate of a microstrip quarter-wavelength parallel-line directional coupler. By proper variation of a bias potential across the P-N



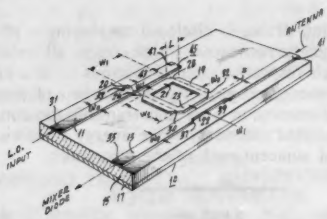
junction, the depletion-layer capacitance of the junction can be altered. This variation in capitance with variation in bias alters the total coupling capacitance between the parallel microstrip transmission lines and, hence, alters the electromagnetic energy coupled.

3,560,887

DIRECTIONAL FILTER COMPRISING A RESONANT LOOP COUPLED TO A TRANSMISSION LINE PAIR

Louis Sebastion Napoli, Trenton, and John Joseph Hughes, Spotswood, N.J., assignors to RCA Corporation, a corporation of Delaware

Filed Aug. 21, 1969, Ser. No. 851,860
Int. Cl. H01h *7/04;* **H01p** *3/08, 5/14*
U.S. Cl. 333—10 **4 Claims**



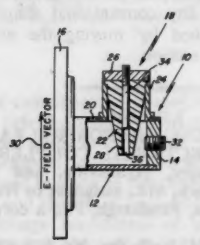
A directional filter includes a resonant loop between a pair of narrow microstrip transmission lines. An open circuit stub at the end of one of the lines extends a particular distance beyond the immediate coupling region between that line and the resonant loop.

3,560,888

MICROWAVE ENERGY TERMINATION DEVICE

Henry W. Perreault, Chelmsford, Mass., assignor to Raytheon Company, Lexington, Mass., a corporation of Delaware

Filed July 31, 1969, Ser. No. 846,397
Int. Cl. H01p *1/26*
U.S. Cl. 333—22 **7 Claims**



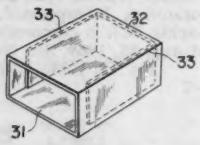
A matched impedance transmission line termination load having electromagnetic energy absorbing means positioned parallel to the electric field vectors of the propagated energy and extending perpendicularly to the longitudinal axis of the line at a point spaced a frequency dependent distance from an energy reflecting terminal end wall. Coarse as well as fine tuning means are provided for refinement of the impedance matching. Heat dissipation means in combination with the absorption means are also disclosed.

3,560,889

TERMINATION FOR ULTRA-HIGH-FREQUENCY AND MICROWAVE TRANSMISSION LINES

Kunihiro Suetake, 11 10-ban, Minami 3-chome, Meguro-ku, Tokyo, Japan, and Yasutaka Shimizu, 2969 Oaza, Iiyama-shi, Nagano-ken, Japan

Filed Aug. 25, 1969, Ser. No. 852,536
Claims priority, application Japan, Aug. 30, 1968, 43/61,753, 43/61,754, 43/61,755
Int. Cl. H01p *1/26*
U.S. Cl. 333—22 **7 Claims**



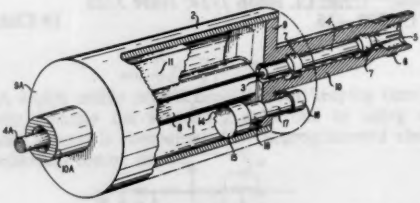
A termination for ultra-high-frequency and microwave transmission lines comprising magnetic material. For coaxial transmission lines, the termination comprises a toroidal magnetic member adjacent the shunt end-plate and cylindrical magnetic members disposed between the inner and outer conductors. For waveguides, magnetic material is disposed adjacent to both the walls of the waveguide and terminating end-plate. The termination for waveguides may also include a tapered resistive film or a V-shaped resistive film.

3,560,890

ROTARY LINE STRETCHER

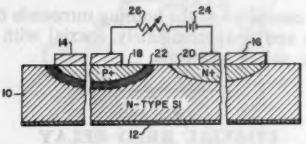
John I. Smith, Morris Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J., a corporation of New York

Filed Nov. 22, 1968, Ser. No. 778,149
Int. Cl. H03h *7/30*
U.S. Cl. 333—31 **9 Claims**



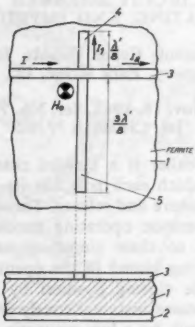
A compact, constant impedance line stretcher is capable of producing a large, continuous change in electrical length. An electrode, secured to the surface of a body of dielectric material, is movable with reference to a stationary electrode. In one extreme position of the movable electrode, air comprises virtually the only dielectric between the electrodes. In an opposite extreme position, a large part of the electric field flux between the electrodes passes through the dielectric body. Throughout intermediate positions, there is a gradual change in the proportion of the flux passing through the dielectric body.

3,560,891
REFLECTION PHASE SHIFTER UTILIZING MICROSTRIP DIRECTIONAL COUPLER
Robert Q. Macleay, Severna Park, and Lawrence R. Whicker, Arnold, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania
Filed Mar. 24, 1969, Ser. No. 809,670
Int. Cl. H01p 1/18, 5/14
U.S. Cl. 333—31 7 Claims



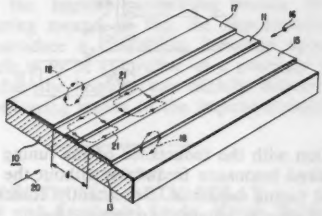
Described is a reflective phase shifter, utilizing microstrip transmission lines, which allows for a continuously variable differential phase shift over a given range. The basic elements of the device are (1) a microstrip quarter-wavelength parallel-line directional coupler formed on a semiconductive substrate and having three of its four arms of specific length and either open-ended or terminated in shorts, (2) a distributed P-N junction formed in the semiconductive substrate in the coupling region between the two parallel microstrips of the coupler and (3) an external direct current voltage source for biasing the P-N junction to change the coupling capacitance between the parallel microstrips.

3,560,892
MICROSTRIP DEVICES HAVING STRIP CONDUCTOR COATED ON FERRITE SUBSTRATE
Bernard Chiron, Paris, France, assignor to Societe Lignes Telegraphiques et Telephoniques, Paris, France, a joint-stock company of France
Filed Nov. 29, 1968, Ser. No. 780,120
Claims priority, application France, Dec. 6, 1967, 131,090
Int. Cl. H01p 5/12, 1/32
U.S. Cl. 333—1.1 3 Claims



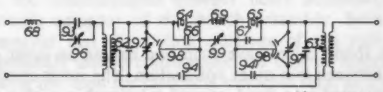
Wide band microstrip devices are designed as conductive films deposited on a ferrite substrate material chosen such that the real component of the permeability is a decreasing function of the frequency in the operating frequency range.

3,560,893
SURFACE STRIP TRANSMISSION LINE AND MICROWAVE DEVICES USING SAME
Cheng Paul Wen, Trenton, N.J., assignor to RCA Corporation, a corporation of Delaware
Filed Dec. 27, 1968, Ser. No. 787,349
Int. Cl. H01p 3/08
U.S. Cl. 333—24.1 18 Claims



A desirable transmission line configuration is described wherein a narrow strip-like conductor and a wider ground conductor are arranged in an adjacent, parallel and coplanar relationship on one surface of a dielectric substrate. Also described herein are many new types of microwave devices such as isolators, phase shifters, couplers, etc. which use this type of transmission line configuration.

3,560,894
BANDPASS FILTER
Alfred L. M. Fettweis, Bochum, Germany, assignor to International Standard Electric Corporation, New York, N.Y., a corporation of Delaware
Original application Oct. 22, 1962, Ser. No. 232,180, now Patent No. 3,344,368, dated Sept. 26, 1967. Divided and this application July 27, 1967, Ser. No. 656,561
Claims priority, application Netherlands, Oct. 27, 1961, 270,714
Int. Cl. H03h 7/04
U.S. Cl. 333—72 3 Claims

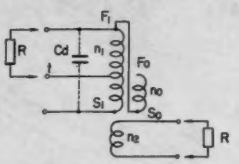


A crystal filter provides an extremely sharp bandpass or cut-off characteristic. To overcome the crystal and the filters inherent internal characteristic limitations, it is isolated between two inductor and capacitor circuits, preferably having unequal impedances. On the input side, the capacitor is in shunt and the inductor is in series with the input terminals. On the output side, the capacitor is in series and the inductor is in shunt with the output terminals. This configuration provides a flexibility which enables a filter designer to provide many species of the invention.

3,560,895
TUNED TRANSFORMER WITHOUT TUNING CAPACITOR
Hiromi Matsumoto, Tokyo-to, Japan, assignor to Toko Kabushiki Kaisha, Higashiyukigaya, Ota-ku, Tokyo-to, Japan, a joint-stock company of Japan
Filed July 10, 1967, Ser. No. 652,085
Claims priority, application Japan, July 14, 1966, 41/46,118; Dec. 20, 1966, 41/115,902, 41/115,903; Dec. 21, 1966, 41/116,452
Int. Cl. H03h 7/08
U.S. Cl. 333—76 2 Claims

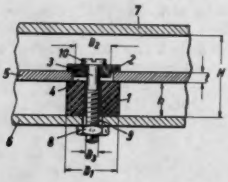
A winding for creating capacitance is wound parallelly together with a part of a tuning coil of a tuned transformer

to produce a distributed capacitance between the terminals of the tuning coil, and points in the winding and coil of respectively different potential are connected to increase the distributed capacitance, which in suitable com-



bination with the inductance of the tuning coil produces a desired resonance frequency without the use of an external tuning capacitor. Consistently constant distributed capacitance is obtained in production.

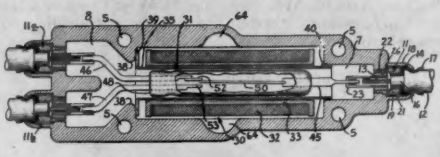
3,560,896
INNER CONDUCTOR SUPPORT FOR SHIELDED MICROWAVE STRIP LINES
Roland Essinger, Backnang, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany
Filed July 8, 1968, Ser. No. 743,116
Claims priority, application Germany, July 6, 1967, P 15 91 696.8
Int. Cl. H01p *3/06*
U.S. Cl. 333—96 **6 Claims**



A shield microwave strip line having an inner conductor between two outer conductors. The inner conductor is maintained in a fixed, spaced relationship with respect to the outer conductors by a supporting means which connects such inner conductor to one of the outer conductors. The supporting means is in the form of a dielectric screw which is inserted through an opening provided in the inner conductor and a dielectric spacer sleeve provided between the inner and the one outer conductor. A metallic lock nut is also provided which fastens the screw in place. The screw is formed to occupy only that portion of the inner conductor opening necessary for compensating the transverse conductance of the supporting means over a wide microwave frequency band.

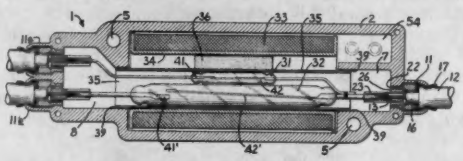
3,560,897
ANTENNA SWITCH
Herbert D. Steinback, Chicago, Ill., assignor to Magnecraft Electric Co., Chicago, Ill., a corporation of Illinois
Filed Apr. 17, 1969, Ser. No. 816,897
Int. Cl. H01h *53/01*
U.S. Cl. 335—5 **7 Claims**

An antenna switch that includes an electro-magnetic relay within a housing. The relay includes a reed switch that has contacts sealed in a longitudinally extending glass capsule, with the switch leads extending from opposite longitudinal ends of the capsule for connection to the inner conductors of coaxial cables that are terminated at the housing, the coaxial cable termination being a part of the housing. A cylindrical conducting shield which is



electrically connected to the housing surrounds the switching capsule and is approximately coaxial with the leads between the switch terminals.

3,560,898
COAXIAL REED RELAY
Herbert D. Steinback, Glencoe, Ill. (5575 N. Lynch Ave., Chicago, Ill. 60630)
Continuation-in-part of application Ser. No. 816,897, Apr. 17, 1969. This application Nov. 13, 1969, Ser. No. 876,459
Int. Cl. H01h *53/01*
U.S. Cl. 335—5 **10 Claims**



The relay includes two sealed reed switches, for selectively connecting a radio antenna to a receiver or to a transmitter. The receiver switch, since it carries much less voltage is the smaller of the two and is designed to minimize introduction of side effects in the minute signals that it carries. A permanent magnet maintains the receiver switch closed. The switches are inside an electromagnetic coil, which when energized closes the larger switch, and by opposing the flux of the permanent magnet, causes the smaller switch to open under its natural bias. This assembly is mounted in a metallic grounded housing that terminates three coaxial cables or their connectors.

3,560,899
ELECTRICAL CIRCUIT BREAKER WITH MULTI-CURRENT RATING AND IMPROVED OPERATING MEANS
Ferdinand E. Chabot, Cedar Rapids, Iowa, assignor to Square D Company, Park Ridge, Ill., a corporation of Michigan
Filed Nov. 18, 1968, Ser. No. 776,317
Int. Cl. H01h *77/02*
U.S. Cl. 335—35 **15 Claims**

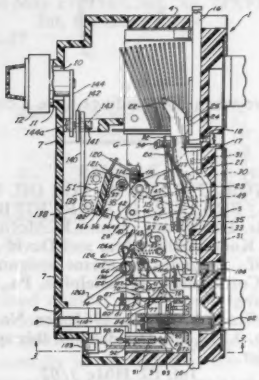
This circuit breaker is a molded case, multi-pole circuit breaker of which each pole has its individual toggle mechanism for closure and release. These mechanisms are operable by a common operating handle so as to cause all of the poles to close simultaneously. Each toggle mechanism is spring biased in the opening direction, but is latched in pole closing position by a high magnetic release which releases instantaneously in event of a high current short circuit, by a low magnetic release which releases at the end of a slightly longer interval, such as in event of a temporary heavy overload, and by a thermal release which releases at the end of a somewhat longer interval due to thermal effects created by longer sustained, but lesser, overloads.

The high magnetic release of each pole operates in bypassing relation to parts of the associated toggle mecha-

nism and to the other releases for quicker releasing action.

The low magnetic release is adjustable for releasing in response to preselected flux intensities.

Transformers supply secondary current for operating the thermal releases for the poles, respectively. The air gaps in the magnetic flux path of each transformer can be changed readily by removable rating columns to assure substantially the same secondary current for any selected primary current within the rated capacity of the circuit breaker.

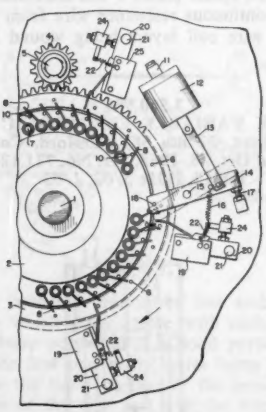


The terminal strap of each pole acts as the primary for creating the operating fluxes.

Means common to all of the pole mechanisms assure concurrent release of all toggle mechanisms instantly upon release of any one of them.

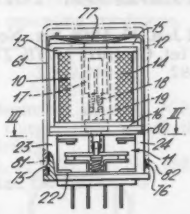
Specific safety features are also present.

3,560,900
MACHINE CONTROLS
Arndt Jentzsch, Heidenau, Germany, assignor to VEB Druckmaschinen-Werk Victoria, Heidenau, Germany
Filed Dec. 18, 1968, Ser. No. 784,670
Int. Cl. H01h *67/06*
U.S. Cl. 335—122 **1 Claim**



A control assembly for controlling a machine such as a printing press. The control assembly includes an input means for introducing into the assembly a movement whose speed has a predetermined relation to the speed of operation of the structure which is to be controlled. An impulse-transmitting means normally has a non-transmitting position but also has a transmitting position where it coacts with the input means for transmitting an impulse along a predetermined path at the speed of movement of the input means. An impulse-delivering means delivers an impulse to the impulse-transmitting means to displace the latter to its impulse-transmitting position in response to a signal received by the impulse-delivering means from the structure which is to be controlled. An impulse-receiving means is situated at a predetermined location along the impulse-transmission path to receive the impulse at a given period of time after the impulse is delivered to the impulse-transmitting means by the impulse-delivering means, so that the impulse-receiving means can introduce a controlling influence upon the structure which is to be controlled at a precisely determined time after the impulse was initially delivered by the impulse-delivering means to the impulse-transmitting means.

3,560,901
ELECTROMAGNETIC RELAY
Shizuka Horii and Fumiyoshi Inada, Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan, a company of Japan
Filed Mar. 12, 1969, Ser. No. 806,665
Claims priority, application Japan, Mar. 26, 1968, 43/23,784
Int. Cl. H01h *45/00*
U.S. Cl. 335—132 **9 Claims**



An electromagnetic relay assembly of the plunger type consisting of separate electromagnet and switch structures, with a snap-on type binding member mounted on the electromagnet structure and gripping the switch structure to hold the two together in a simplified manner so that the electromagnet plunger bears accurately on the movable actuator of the switch assembly. Both the electromagnet and the switch portions of the unit are of conveniently simple construction for ease of assembly, eliminating the need for fastening elements such as screws and the like. The entire assembly is fitted within a housing, and a separate mounting element is provided for securing the relay to a wall structure.

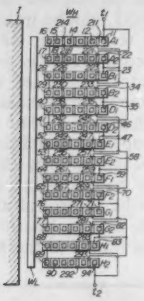
3,560,902
METHOD OF PROVIDING STATIC SHIELDING OF TRANSFORMER WINDINGS
Kenichi Okuyama, Hitachi-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed June 14, 1967, Ser. No. 645,980
Int. Cl. H01f *15/14*
U.S. Cl. 336—70 **9 Claims**

The present disclosure relates to a method and apparatus for providing improved static shielding of transformer windings. The improved static shielding is comprised by inserting series capacitance between the winding turns in a manner such that the value of a first series capacitance C_{s1} on the line side of the transformer is related to the value of a last series capacitance C_{sn} on the earth side of the transformer in accordance with the expression

$$\sqrt{\frac{C_{sn}}{C_{s1}}}=k\frac{C_{s1}}{C_{g1}}$$

wherein k is a constant having a value below 0.05 and C_{g1} is the capacitance to earth of all the turns the values

of series capacitance of the intermediate turns between said series capacitance C_{s1} and C_{sn} and are related in a

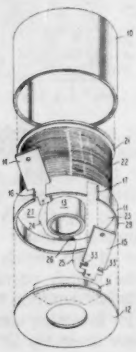


manner such that said intermediate values vary approximately linearly between the values of said series capacitances C_{s1} and C_{sn}.

3,560,903
ELECTROMAGNETIC COIL CONSTRUCTION

Stephen Foldes, 38 Front St. 13905, and Louis A. Jimenez, 524 Midvale Road 13903, both of Binghamton, N.Y.

Filed Jan. 30, 1969, Ser. No. 795,151
Int. Cl. H01f *15/10, 27/30*
U.S. Cl. 336—92 **6 Claims**



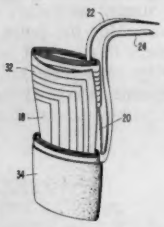
An electromagnetic coil construction is described in which the component elements comprise a bobbin of thermoplastic material around which the wire is wound. The base flange of the bobbin has a hollow portion, the wall of which supports terminal inserts. A thermoplastic cover over this portion locks the inserts in place. A tubular shell placed over the bobbin envelops the winding. The rim of the shell, as well as the rim of the flange, are tapered at the edge for sonic welding of the shell and the cover to the base flange.

3,560,904
ELECTRIC COILS

Donald F. Wilkes, Albuquerque, N. Mex., assignor to Rolamite Technology, Incorporated, San Francisco, Calif., a corporation of California

Filed Apr. 19, 1968, Ser. No. 722,615
Int. Cl. H01f *27/28, 41/04*
U.S. Cl. 336—180 **14 Claims**

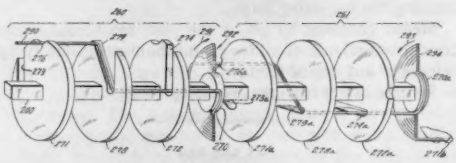
An electric coil in which the turns of the conductor are wound in multiples, rather than in single strands. The conductor is printed or otherwise provided on a web of insulating material. The conductor is arranged in a spiral pattern around a central opening in the web. The web on opposite sides of the opening is wound in opposite directions so that the flux produced by current in the conductor is additive when the windings have a common central axis.



3,560,905
RESISTOR STRUCTURE FOR OIL CIRCUIT BREAKER INTERRUPTER

Earl B. Rietz, La Canada, James R. McCloud, Burbank, Hubert J. Koenn, Alhambra, and David A. Wall, Pasadena, Calif., assignors, by mesne assignments, to I-T-E Imperial Corporation, Philadelphia, Pa., a corporation of Delaware

Original application Mar. 12, 1965, Ser. No. 439,304, now Patent No. 3,392,248. Divided and this application June 7, 1968, Ser. No. 764,975
Int. Cl. H01c *3/02*
U.S. Cl. 338—62 **3 Claims**

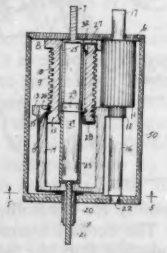


A non-inductive resistor structure for the parallel resistor in an oil circuit breaker in which individual resistor coil layers are wound above one another and are clamped together by a central insulation rod. Each coil layer is disposed between spacer plates which are slotted to permit passage of a continuous resistance wire from coil to coil with adjacent wire coil layers being wound in opposite directions.

3,560,906
INFINITELY VARIABLE ELECTRONIC DEVICE

Eric C. Wahlberg, 32 8th St., Stamford, Conn. 06905

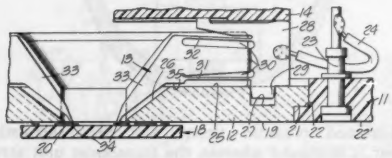
Filed Oct. 28, 1968, Ser. No. 771,126
Int. Cl. H01c *5/02, 1/02*
U.S. Cl. 338—145 **6 Claims**



Two electrical elements are mounted for independent rotation in the same direction about a common axis and, as a result of the rotation, a longitudinal displacement

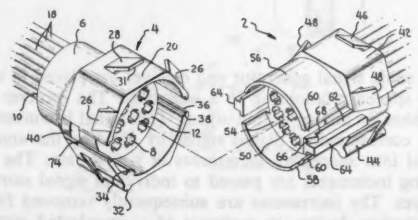
with respect to each other, said elements being in electrically coactive relationship whereby electrical values depend upon the longitudinal displacement caused by the rotation of the two elements.

3,560,907
TEST CONNECTOR FOR MICROMINIATURE CIRCUITS
Peter V. N. Heller, Orange, Calif.
(213 Esplanade, San Clemente, Calif. 92672)
Filed May 17, 1968, Ser. No. 729,971
Int. Cl. H01r *13/24*
U.S. Cl. 339—17 **11 Claims**



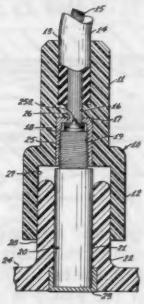
A predetermined number of thin, spring-like, metallic connection members are received within slots in an annular insulative base. The major planes of the members are disposed normally to the plane of the annular base with the member edges each having a pointed end located in the opening of the base. The members are configured such that on moving the base toward a circuit to be tested sufficiently to bring the pointed members ends into contact with predetermined circuit points all resilient motion of the members is normal to the circuit.

3,560,908
ELECTRICAL CONNECTOR HAVING IMPROVED MOUNTING MEANS
Harry John Dell, Mechanicsburg, and Earl Earnest Folkenroth, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation of application Ser. No. 569,946, Aug. 3, 1966. This application Nov. 25, 1968, Ser. No. 778,864
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 **5 Claims**



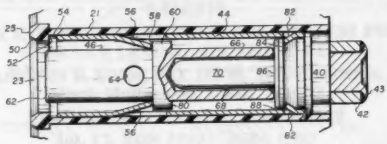
Electrical connector comprises first and second connector parts which are matable with each other. Each part has a body portion and a hood portion, the hood portion of the first one of the parts being telescopically receivable in the hood portion of the second part. The body portion of the first part and the hood portion of the second part have the same outside dimensions and cross-sectional configuration so that the body portion and the hood portion of the first and second parts respectively can be inserted into a panel opening of one size. Securing means, in the form of integral divergently extending ears, are provided on the body portion of the first part and the hood portion of the second part so that either part can be mounted in a panel.

3,560,909
TERMINAL CONNECTOR
James R. Wyatt, 2553 W. Rose Lane, Apt. 219, and Alan N. Wright, 3208 W. Glenrosa, both of Phoenix, Ariz. 85017
Filed July 10, 1968, Ser. No. 743,655
Int. Cl. H01r *11/20*
U.S. Cl. 339—100 **3 Claims**



A terminal connector having a contact which is positively engaged with the wire conductor in a manner to effect low resistance electrical contact while preventing the disconnection of the conductor from the terminal connector under severe operating conditions.

3,560,910
MODULE
Charles William Sosinski, Linden, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J., a corporation of New Jersey
Filed Aug. 5, 1968, Ser. No. 750,265
Int. Cl. H01r *9/08*
U.S. Cl. 339—217 **10 Claims**

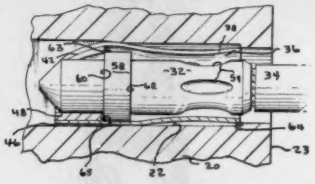


The disclosure is directed to the construction of a module employed in a rear release type of connection system. More particularly the disclosure is directed to the manner of mounting and electrically and mechanically interconnecting metallic spring retaining sleeves with the male connector pin to retain the spring sleeve within the bore of an insulating module block and to retain the entire assembly comprising the spring retaining sleeve, the male connector and the various bus bars within the overall module. Various methods are described and disclosed for providing the mechanical and electrical connection between the male connector pin and the spring retaining sleeve to retain both within the module.

3,560,911
DISENGAGEABLE ELECTRICAL CONNECTIONS HAVING IMPROVED CONTACT SPRING MEANS
John Aaron Zimmerman, Jr., Hershey, and Clarence Leonard Paullus, Camp Hill, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of application Ser. No. 640,649, May 23, 1967. This application Sept. 24, 1968, Ser. No. 762,088
Int. Cl. H01r *13/12*
U.S. Cl. 339—258 **8 Claims**

Pin and socket connecting means in which the socket comprises a stamped and formed cylindrical body portion which is adapted to receive the pin at one end thereof and

which has ears extending from its other end obliquely inwardly with respect to the axis of the body portion. The body portion of the socket has an axially extending open seam and is contained relatively snugly within a cylindrical cavity in an insulating housing. The ears are relatively rigid and are rigidly connected to the body portion so that when the pin is inserted into the socket, the ears are moved relatively outwardly, however, because of the fact



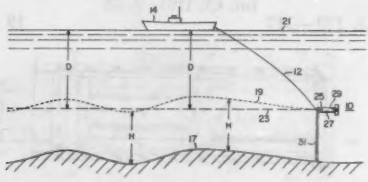
that the ears are rigid and nonflexible, the body portion of the socket is forced to elastically deform to accommodate the movement of the ears. Because of the fact that the body portion of the socket is circumferentially confined in the cavity, the body portion deforms along its length and functions as a spring means maintaining electrical contact between the socket and the leading end of the inserted pin.

3,560,912

CONTROL SYSTEM FOR A TOWED VEHICLE

Paul G. Spink, Severna Park, and James T. Malone, Arnold, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Feb. 3, 1969, Ser. No. 795,913
Int. Cl. B63b *21/00*; B64d *3/00*; G01s *9/68*
U.S. Cl. 340—3 **6 Claims**



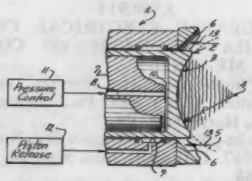
A towed underwater vehicle having rotatable wing and tail surfaces is maintained in a predetermined orientation at a constant height above the ocean bottom, or at a constant depth below the surface, by commanding a rate of rotation of the wing or tail surfaces when a deviation from the desired attitude occurs.

3,560,913

ACOUSTIC PULSE FOCUSING MEANS

Lawrence G. Copley, Cambridge, Mass., assignor, by mesne assignments, to the United States of America as represented by the Secretary of the Navy

Filed Oct. 9, 1968, Ser. No. 766,083
Int. Cl. H04r *23/00*
U.S. Cl. 340—8 **2 Claims**



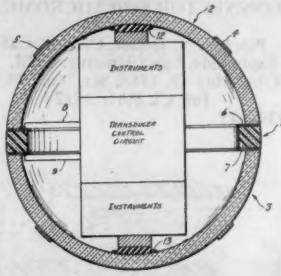
An acoustic impulse generator is provided with a concave piston head for focusing the pulse generated by the head to a point ahead of the generating surface.

3,560,914

TRANSDUCER VESSEL

Douglas C. Webb, Falmouth, Mass., assignor to the United States of America as represented by the Secretary of the Navy

Filed July 3, 1968, Ser. No. 744,614
Int. Cl. H04r *17/10*
U.S. Cl. 340—10 **3 Claims**



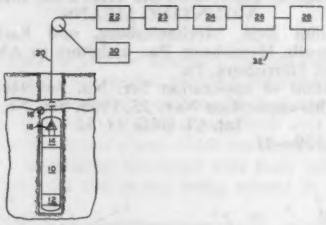
A combined pressure vessel and electroacoustical transducer is disclosed wherein the transducer unit serves as a portion of the casing. In one construction, the transducer is an annular member positioned between a pair of hemispheres. All transducer electrical connections are internal and the apparatus consequently can withstand maximum hydrostatic pressures.

3,560,915

SONIC AMPLITUDE LOGGING

Sheldon E. Elliott and Joe P. Lindsey, Bartlesville, Okla., assignors to Phillips Petroleum Company, a corporation of Delaware

Filed Dec. 12, 1966, Ser. No. 601,081
Int. Cl. H03k *13/02*
U.S. Cl. 340—18 **6 Claims**



A sonic signal generator and receiver are placed in vertical spaced relationship in a well bore. The receiver establishes an analog output signal. This signal is converted to a corresponding digital signal by dividing the analog signal into successive increments at a first rate. The resulting increments are passed to individual signal storage devices. The increments are subsequently removed from the storage devices in sequence at a preselected second rate which is slower than the first rate, and the removed increments are converted into corresponding digitized signals.

3,560,916

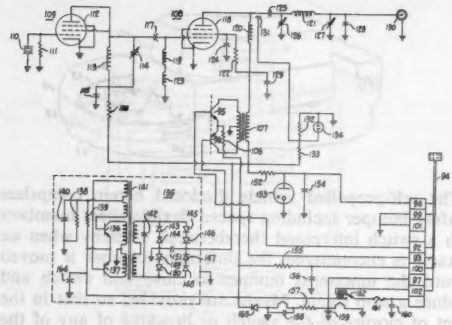
LOCATOR SIGNAL SYSTEM FOR VEHICLE TRANSPORTABLE SIGNAL GENERATORS

William T. Buckingham, 2580 Africa Road, Box 125B, Galena, Ohio 43021, and Gordon R. Hammon, Fairview Park, Ohio (Windsor Drive, Amherst, N.H. 03031)

Filed Dec. 12, 1966, Ser. No. 601,036
Int. Cl. G08g *1/12*
U.S. Cl. 340—23 **2 Claims**

A transportable electronic signalling equipment carried by a vehicle with means for activation through mechani-

cal linkage with the distance measuring equipment of the vehicle, and comprising a mechanical switching assembly causing it to advance modulating the radio frequency of the transmitted signal at predetermined locations, the modulation occurring in such a manner as to indicate upon multiple receivers the one mile segment of proximity



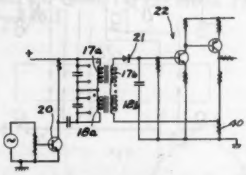
separating the transmitter and receivers through upward shifts of the freqency of oscillation of approximately one hundred cycles per second, the receivers being tuned to receive and be activated by only the desired segment of transmitter freqency of oscillation, amplified, relayed to visual or audible warning system to give the desired proximity information of the vehicular approach.

3,560,917

MAGNETIC SIGNAL SENSING DEVICE FOR SELF-PROPELLED VEHICLES AND THE LIKE

Kenneth A. Wilson, Locust Valley, N.Y., assignor, by mesne assignments, to American Chain & Cable Company, Inc., New York, N.Y., a corporation of New York

Filed Nov. 2, 1967, Ser. No. 680,116
Int. Cl. G08g *1/01*
U.S. Cl. 340—23 **24 Claims**



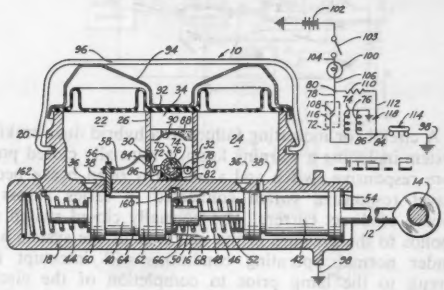
This specification discloses a vehicle which is adapted to follow a predetermined path defined by a wire or the like embedded in the floor. The vehicles support a plurality of pickup devices which are responsive to magnetic field devices embedded in the floor past which the vehicles move. Each signal device is associated with two transformers. Each transformer comprises a primary coil associated with a high frequency source of alternating current and a secondary coil. One of the transformers is oriented with respect to the other so that it is more sensitive to the presence of a magnetic field along the path than the other transformer. Circuitry is provided for rectifying and amplifying any signal produced by the sensing of a magnetic field by said transformer pairs.

3,560,918

INDICATOR MEANS FOR FLUID PRESSURE AND FLUID SUPPLY

Richard L. Lewis, George M. Tam, and Raymond A. Reznicek, St. Joseph, Mich., and Winford Boyd Carruth and Ralph Wolf Carp, Baltimore, Md., assignors to The Bendix Corporation, a corporation of Delaware

Filed Dec. 8, 1967, Ser. No. 689,088
Int. Cl. B60t *17/22*
U.S. Cl. 340—52 **12 Claims**



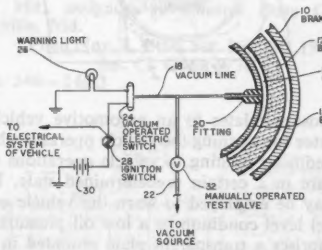
Magnetic switch means within a fluid actuator having a closed electrical circuit means operative on failure to develop pressure and/or low fluid supply to warn an operator of such problems.

3,560,919

WEAR INDICATING SIGNALLING SYSTEM FOR A BRAKE LINING, OR THE LIKE

Armando R. Uribe, P.O. 16978, 11744 Hatteras, North Hollywood, Calif. 91607

Filed Nov. 12, 1968, Ser. No. 775,089
Int. Cl. B60t *17/22;* **B60q** *1/00*
U.S. Cl. 340—52 **4 Claims**



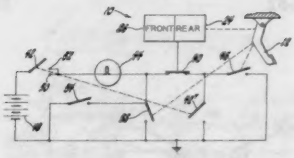
A pneumatic system is provided for indicating excessive wear of a normally unobservable wearing surface, such as a brake lining. The system of the invention includes air lines coupled to a pressure tight groove in the brake lining and to a vacuum pressure or positive pressure source, so as to maintain the system in a nonoperative state so long as the pressure tight integrity of the aforesaid groove is maintained. When the wear of the brake lining reaches a critical state, the groove is exposed, and the resulting pressure change in the system is utilized to activate a visual or audible alarm unit.

3,560,920

BRAKE SYSTEM FAILURE WARNING CIRCUIT

Douglas J. Wing, St. Clair Shores, and Bernard G. Mazurek, Jr., Taylor, Mich., assignors to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed Nov. 29, 1968, Ser. No. 779,913
Int. Cl. B60t 17/22
U.S. Cl. 340—52 5 Claims



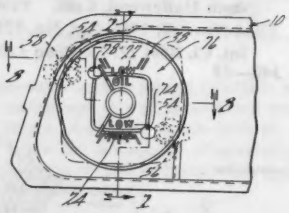
A circuit for indicating failure in a hybrid dual braking system including a warning lamp, a normally closed pressure responsive switch and a normally open brake pedal travel responsive switch connected in series across a source of direct current. The normally closed switch responds to the pressure in the rear half of the system and under normal operating conditions will interrupt the circuit to the lamp prior to completion of the circuit through the brake pedal travel responsive switch. Upon loss of pressure to the rear half of the system, the lamp is continuously energized and upon loss of pressure to the front half of the system, the lamp is momentarily energized.

3,560,921

AUTOMOTIVE VEHICLE CONDITION INDICATOR UTILIZING HOLOGRAMS

Lawrence A. Lopez, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

Filed Dec. 19, 1968, Ser. No. 785,111
Int. Cl. B60q 1/00
U.S. Cl. 340—52 12 Claims



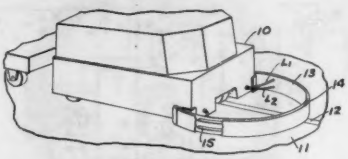
This disclosure relates to an automotive vehicle condition indicator for warning the vehicle operator when one or more conditions relating to vehicle operations are abnormal or are in a certain predetermined state. For example, it may be employed to warn the vehicle operator of a low fuel level condition or a low oil pressure condition. It comprises a transparent plate mounted in the instrument panel in the view of the vehicle operator. A hologram is positioned in this transparent plate and the hologram comprises a series of letters indicating the fact that a vehicle operation is abnormal or is in a certain predetermined state. For example, the hologram may comprise a series of letters "LOW OIL" or "LOW FUEL." Means are mounted in the instrument panel and positioned adjacent the transparent plate and the hologram for illuminating the hologram when the predetermined operating condition occurs. The transparent plate may be the pre-existing transparent plate in an instrument panel positioned over the scale and indicating means of certain gages, for example, the oil gage and fuel gage.

3,560,922

SELF-PROPELLED VEHICLE WITH SAFETY BUMPER

Kenneth A. Wilson, Locust Valley, N.Y., assignor, by mesne assignments, to American Chain & Cable Company, Inc., New York, N.Y., a corporation of New York

Filed Nov. 2, 1967, Ser. No. 680,129
Int. Cl. B60q 9/00
U.S. Cl. 340—61 7 Claims



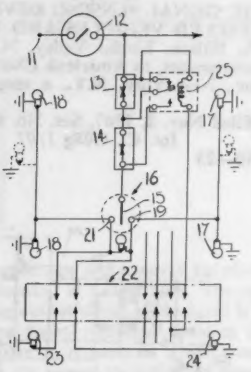
The self-propelled vehicle disclosed herein comprises a safety bumper including spaced flexible sheet members with a switch interposed therebetween whereby when an obstacle is encountered, the outermost bumper is moved toward the innermost bumper to close said switch and produce a stop signal. Means are provided so that in the event of closure of the switch or breaking of any of the leads to the switch, a stop signal is produced.

3,560,923

DIRECTION INDICATOR SYSTEMS FOR TRACTOR-TRAILER VEHICLES

Eric Bernard Parkes, Selly Oak, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed June 25, 1969, Ser. No. 836,447
Claims priority, application Great Britain, July 25, 1968, 35,482/68
Int. Cl. B60q 1/38
U.S. Cl. 340—81 3 Claims



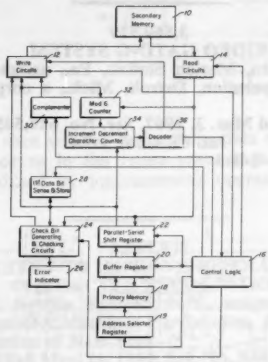
A direction indicator system for a tractor-trailer vehicle has a direction indicator switch on the tractor through which the lamps on the tractor can be energised and a supply terminal on the tractor. First and second flasher units are connected in series between the supply terminal and the movable contact of the direction indicator switch, and an electrical connector on the tractor is provided for engagement with a complementary connector on a trailer, these connectors when engaged connecting the flasher lamps at opposite sides of the trailer in parallel with the flasher lamps at opposite sides of the tractor respectively. A two position switch is used which in one position short-circuits the first flasher unit and in its other position short-circiuts the second flasher unit, so that the correct flasher unit is always used depending on whether the trailer vehicle is in operation, or not.

3,560,924

DIGITAL DATA ERROR DETECTION APPARATUS

William J. McBride, Wayland, Mass., assignor to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware

Continuation of application Ser. No. 518,724, Jan. 4, 1966. This application Oct. 1, 1969, Ser. No. 862,974
Int. Cl. G06f *11/12;* H03k *5/18;* H04l *7/10*
U.S. Cl. 340—146.1 9 Claims



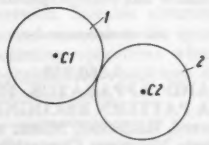
In a digital information transfer system incorporating a cyclic code error checking scheme, an apparatus for sensing errors resulting from an end-around shift complements the first bit of serially transmitted data and appends it to the transmitted message, thereby providing additional information by which to sense errors not otherwise detectable by a cyclic checking scheme alone.

3,560,925

DETECTION AND CORRECTION OF ERRORS IN BINARY CODE WORDS

Horst Ohnsorge, Erstetten, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany

Filed Mar. 25, 1968, Ser. No. 715,793
Claims priority, application Germany, Mar. 25, 1967, T 33,526, T 33,527
Int. Cl. G06f *11/12;* H03k *13/32*
U.S. Cl. 340—146.1 8 Claims



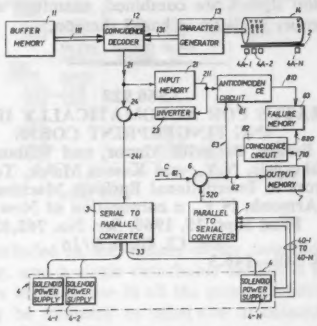
A method and arrangement for detecting and correcting errors occurring in code words made up of a data code and a test code, which test code is derived by multiplying the data code by a selected coding matrix, by multiplying the received word by an error matrix, composed of the coding matrix supplemented by a unit matrix, to derive an error code which will equal zero only when no errors appear in the received word, and by adding a succession of error-correction words in a modulo 2 manner to the received word until producing an addition word whose error code is equal to zero.

3,560,926

ERROR CHECKING CIRCUIT FOR DIGITALLY CONTROLLED PRINTERS

Jaroslav Mrkvicka, Prague, Czechoslovakia, assignor to Vyzkumny ustav matematickych stroju, Prague, Czechoslovakia, a corporation

Filed May 16, 1968, Ser. No. 729,825
Claims priority, application Czechoslovakia May 15, 1967, Ser. No. 3,511/67
Int. Cl. G06f *11/00*
U.S. Cl. 340—146.1 5 Claims



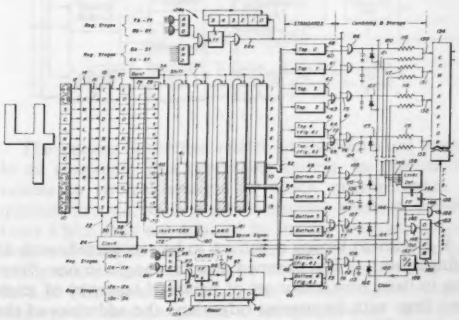
A checking circuit is arranged to detect malfunctions in the output portion of a digitally controlled printer whose incoming digital control information is in the form of successive first frames having N time slots each. The first frames are converted to N parallel paths selectively containing command bits for N solenoid-actuated hammers in the printer. A parallel pulse pattern corresponding to those of the hammer solenoids actually excited is converted to serial form as successive second frames. The latter are compared with the first frames in an anticoincidence gate, and successive second frames are compared (after a relative delay of N time slots) in a coincidence gate. The outputs from anticoincidence and coincidence gates are respectively indicative of imperfect operation of the hammer actuating power supply and of erroneous double printing.

3,560,927

MULTI-FONT READING MACHINES

Jacob Rabinow, Bethesda, and Sidney Greenwald, Hyattsville, Md., assignors to Control Data Corporation, Rockville, Md.

Filed Nov. 4, 1966, Ser. No. 592,194
Int. Cl. G06k *9/10*
U.S. Cl. 340—146.3 5 Claims



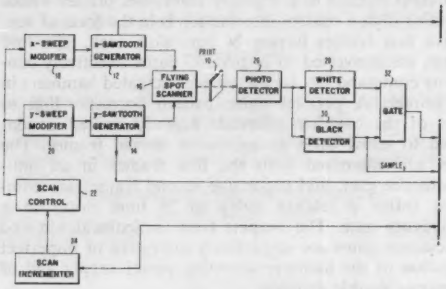
An optical character reading machine capable of reading numerous fonts by having electronic character criteria arranged in first and second sets where the first set has

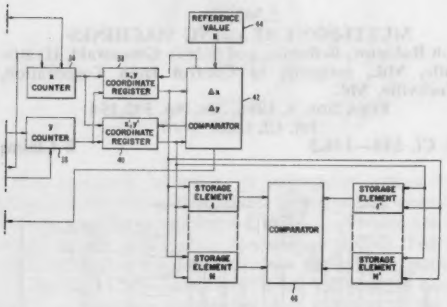
representations of various shapes of the top portions of a character and the second set has representations of various shapes of the bottom portion of the character. The numerous possible permutations of shapes yields valid criteria for many fonts of the same character. The machine scans a printed character and the scanner-extracted signals are formed in first and second groups for comparison to the first and second sets of criteria. Resulting first and second correlation signals are combined and examined for the optimal signal from each set. The best of the resulting first signals and the best second correlation signals are combined, examined and a character-identity decision is based thereon.

3,560,928
APPARATUS FOR AUTOMATICALLY IDENTIFYING FINGERPRINT CORES

Jay M. Berger, Briarcliff Manor, and Wilbur J. Levine, Poughkeepsie, N.Y., and Kasem Malek, Tehran, Iran, assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed Sept. 25, 1968, Ser. No. 762,433
Int. Cl. G06k *9/16*
U.S. Cl. 340—146.3 **8 Claims**



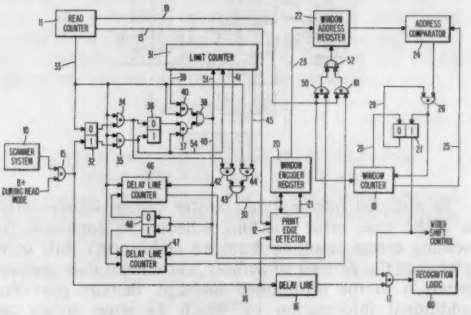


A document having a pattern to be recognized, such as a fingerprint, is first scanned at a first angle in one direction to determine a first set of points of tangency of scanning lines with fingerprint ridges and the addresses of the *x*, *y* coordinates of these points are stored in digital storage means. The scan is then rotated to an angle of about 60° to 120° to the first angle and a second scan is effected to produce a second set of like points of tangency and the addresses of the *x*, *y* coordinates of the second points are also stored. The addresses produced by both scans are respectively compared and that comparison between first and second scan addresses which shows a difference of less than a chosen value (the distance between adjacent ridges of the fingerprint) is the location at which the scans converge and which is substantially the focal point of the fingerprint. Such focal point is now reproducible, no matter what the angle of disposition of the fingerprint is in the viewing area.

3,560,929
VIDEO GATING SYSTEM

David M. Stern, Merion Station, Pa., assignor to Burroughs Corporation, Detroit, Mich., a corporation of Michigan

Filed Mar. 3, 1967, Ser. No. 620,545
Int. Cl. G06k *9/04*
U.S. Cl. 340—146.3 **19 Claims**



A video gating system for use in a character recognition system for gating a portion of the video associated with each character to be identified. A print edge detector selects a 20 row sub-set out of 30 rows into which each scan of a character is arbitrarily divided. The sub-set is selected by determining the row located three rows below the first of the two adjacent rows containing black video information. The selected row is encoded as a number and compared to the output of a counter. When the number equals the output of the counter, a gate is opened for each scan for the time it takes 20 rows of data to pass through into the recognition logic. Delay means between the video and the gate are provided to delay the video associated with a particular character from passing through until the appropriate window has been prepared.

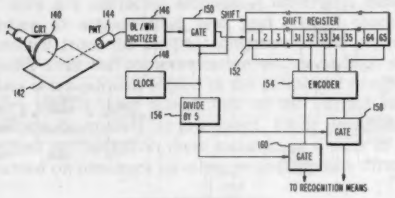
3,560,930
METHOD AND APPARATUS FOR REDUCING DATA IN A PATTERN RECOGNITION SYSTEM

Philip H. Howard, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed Jan. 15, 1968, Ser. No. 697,841
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 **11 Claims**

A data reduction method in pattern analysis is disclosed herein in three separate physical embodiments. The method is to interleave data reducing measurements. Adjacent measurements are nonoverlapping and are interleaved so that they are not in horizontal or vertical alignment. Since the measurements are not so aligned, they produce a more accurate reduction of data. In other words, the position of the pattern under the data reducing measurements has little effect on the reduced data. The

interleaving may be accomplished using any type of scanner such as cathode ray tube, linear array of photosensitive devices or retina array of photosensitive devices. Video data from these scanners can be either temporarily

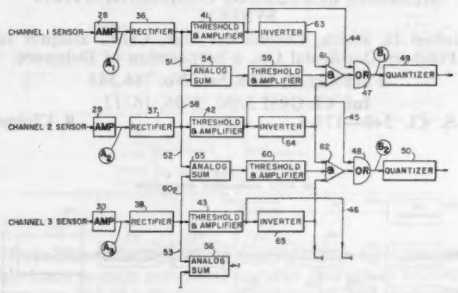


stored and then selected to form the data reducing measurements, or as in the retina scanner the data can be directly reduced by measurements operating off of the retina.

3,560,931
CIRCUITRY TO IMPROVE RESOLUTION IN CHARACTER RECOGNITION

Richard G. Neville, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed Mar. 26, 1969, Ser. No. 810,703
Int. Cl. G06k *9/04;* **G11b** *5/00*
U.S. Cl. 340—146.3 **11 Claims**



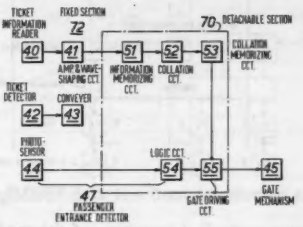
This disclosure is directed to an improved character recognition system. In particular, it utilizes a parallel operating multi-channel digital-type of detector system which provides compensation for any variations in alignment of the character-to-scanner registration. The system operates through the use of scanners each having a quantizer circuit associated therewith. Suitable summing circuits are arranged to receive and transmit to the quantizer the output of adjacent scanning operations which collectively overcome any mis-registration conditions of any character relative to any scanning units.

3,560,932
AUTOMATIC TICKET EXAMINING SYSTEM AND GATE CONTROL SYSTEM

Tadao Morita, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan, a company of Japan

Filed Sept. 19, 1968, Ser. No. 760,916
Claims priority, application Japan, Sept. 29, 1967, 42/62,780
Int. Cl. H04q *9/00*
U.S. Cl. 340—149 **11 Claims**

An automatic ticket examining system comprising a plurality of ticket gates, wherein a selected one or more of the gates perform all the functions of a complete ticket gate, that is, receiving a ticket, checking its validity, opening or closing the gateway depending upon the validity or invalidity of the ticket and returning or collecting the ticket, while the other ticket gates perform only those functions which make them look as if they were operating as a complete ticket gate. The component parts required to make a complete automatic ticket gate are divided into two complementary groups or sections, that is, a fixed section and a detachable section. Each of

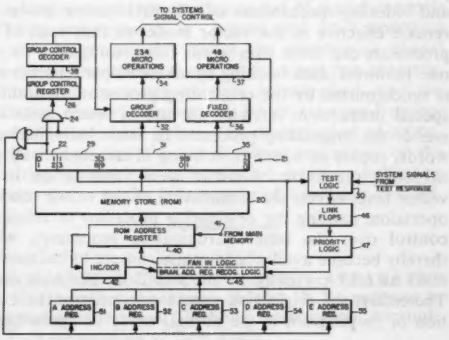


the gates included in the system of the invention has a fixed section, and a single detachable section is provided for common selective use in all the gates. The detachable section may be mounted or otherwise associated with a desired one of the ticket gates so as to cause only that one ticket gate to work as a complete ticket gate, while leaving the other ticket gates in the system performing only those functions which make them look as if they were complete ticket gates.

3,560,933
MICROPROGRAM CONTROL APPARATUS

Scott J. Schwartz, Sharon, Mass., assignor to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware

Filed Jan. 2, 1968, Ser. No. 694,928
Int. Cl. G05b *15/00;* **G06f** *15/20*
U.S. Cl. 340—172.5 **19 Claims**



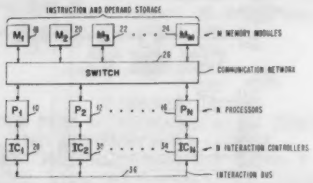
The present invention relates to subcommand control in an electronic data processing system. In particular it relates to control systems in which microprogram sequences are stored in a nondestructive readout memory from which they are selected by master program instructions and used to direct the micro operations in the central processor. In accordance with the invention, one field of bits from a word in the nondestructive readout memory is used to switch a second field of bits from controlling one set of micro operations to any one of several sets. In the overall system, the one field of bits was obtained nearly "free" by sharing bits used for branch addresses.

3,560,934

ARRANGEMENT FOR EFFECTING VECTOR MODE OPERATION IN MULTIPROCESSING SYSTEMS

Henry A. Ernst, Pleasantville, Meir M. Lehman, Bronx, Jack L. Rosenfeld, Tarrytown, and Hans P. Schlaeppi, Chappaqua, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed June 10, 1969, Ser. No. 831,897
Int. Cl. G06f *9/18, 9/19*
U.S. Cl. 340—172.5 **20 Claims**



A program controlled transition of the mode of operation of a multiprocessor system, from the normal multiprocessing mode (independent execution of distinct instruction sequences or tasks by a plurality of processors) to the vector mode (synchronous execution of identical instruction sequences or vector task by a plurality of processors) is effected by the execution of a special instruction by one one of the processors engaged in a multiprocessing task, which thereby becomes the so-called originating processor of a vector task. In executing this special instruction, the originating processor acquires control over a specified number of the other processors that have so far been executing independent task, causing them to interrupt the tasks they are engaged in, and then to participate in the incipient vector task. In a set of processors participating in a vector task, the originating processor alone fetches instructions from storage, distributing them to the other participating processors. The instruction sequencing mechanism of each one of the other participating processors, while required in the normal multiprocessing mode, is disabled for as long as that processor continues in the vector mode. The addressing and indexing mechanisms of all participating processors remain effective in the vector mode, so that each of the processors can fetch data words from storage for its own use. However, data fetching by all participating processors is synchronized by the originating processor. In addition, special instructions intended for use in vector tasks only enable the originating processor to fetch individual data words, copies of which then being distributed to all participating processors. Another special instruction in the vector tasks effects the termination of the vector mode of operation, causing the originating processor to relinquish control over the other participating processors, which thereby become available for reassignment to independent tasks as may currently be on record on the task queue. Thereafter, the originating processor continues the execution of its program in the normal mode of operation.

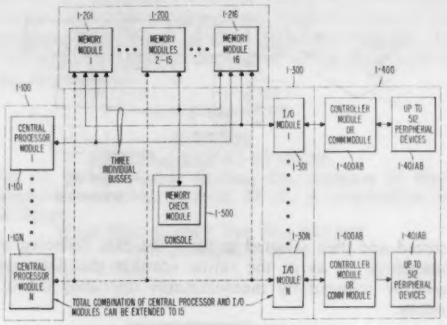
3,560,935

INTERRUPT APPARATUS FOR A MODULAR DATA PROCESSING SYSTEM

Leroy W. Beers, Downingtown, Pa., assignor to Burroughs Corporation, Detroit, Mich., a corporation of Michigan

Filed Mar. 15, 1968, Ser. No. 713,426
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **22 Claims**

The present application discloses an interrupt system capable of use in a fully modular data processing system. It provides apparatus means for enabling not only recordation and immediate responsive recognition of a comprehensive set of interrupt conditions but also for recordation without immediate responsive recognition of such conditions. In addition, it provides an interrupt system which is operative in its interrupted or control mode to execute


MEMORY MODULE 1
MEMORY MODULES 2-15
MEMORY MODULE 16
CENTRAL PROCESSOR MODULE 1
CENTRAL PROCESSOR MODULE N
THREE INDIVIDUAL BUSSES
MEMORY CHECK MODULE
CONSOLE
I/O MODULE 1
I/O MODULE N
CONTROLLER MODULE OR COMM MODULE
UP TO 512 PERIPHERAL DEVICES
TOTAL COMBINATION OF CENTRAL PROCESSOR AND I/O MODULES CAN BE EXTENDED TO 15

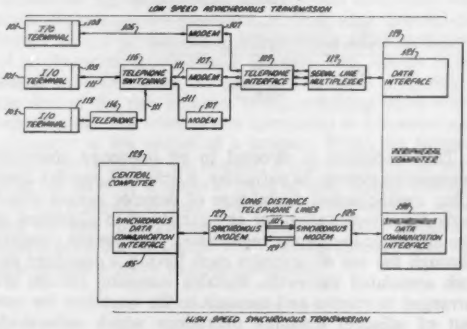
object programs which heretofore could be executed only in its normal mode of operation. It also discloses an interrupt system having improved external interrupt capabilities especially in the module fail area.

3,560,936

MESSAGE BUFFERING COMMUNICATION SYSTEM

Michael D. Busch, Corona del Mar, Calif., assignor to Pillsbury-Occidental Co., a corporation of Delaware

Filed Oct. 8, 1968, Ser. No. 766,384
Int. Cl. G06f *3/00, 5/06, 16/11*
U.S. Cl. 340—172.5 **9 Claims**



Apparatus and method for transmitting data on a time-shared basis between a plurality of low-speed sources and a high-speed source over a communication circuit. Byte-serial data is initially transmitted at a relatively low rate from a plurality of remote sources (terminals) to a nearby peripheral computer which temporarily stores the incoming data in a memory unit and arranges it into strings of data blocks. The stored data is later transmitted as messages of one or more data blocks at a much faster rate over a communication circuit to a central computer. These data blocks may be either text blocks containing the temporarily stored data or control blocks containing information regarding the status of remote terminals. In addition, each message contains an acknowledge block

whose purpose is to facilitate the detection and correction of data transmission errors. The central computer checks all incoming blocks for errors and acknowledges only those that have been correctly received. Blocks received in error by the central computer are not acknowledged, and are retransmitted by the peripheral computer until they are correctly received. Conversely, messages consisting of acknowledge, text, and control blocks are transmitted from the central computer to the peripheral computer over the communication circuit at high speed, the data is temporarily stored in the peripheral computer's memory and is later transmitted to the correct remote destination (terminal) at low speed. Error detection and correction performed on these messages is similar to those performed on messages traveling in the opposite direction.

3,560,937

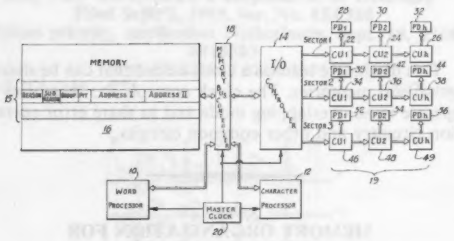
APPARATUS FOR INDEPENDENTLY ASSIGNING TIME SLOT INTERVALS AND READ-WRITE CIRCUITS IN A MULTIPROCESSOR SYSTEM

Robert P. Fischer, Norfolk County, Mass., assignor to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware

Filed Oct. 28, 1968, Ser. No. 771,147

Int. Cl. G06f *15/16, 15/40*

U.S. Cl. 340—172.5 **13 Claims**



Data processing apparatus responds on a freely assignable basis to each peripheral transfer instruction received from any one of a plurality of processors, and establishes communication between the system memory and the specified peripheral device. The apparatus assigns a read-write control circuit and assigns a plurality of time slot intervals, collectively or independently, to process each request in accordance with the transfer rate of the peripheral device.

3,560,938

DATA STEERING CIRCUIT

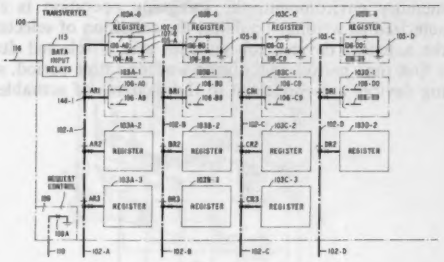
John J. Collins, Richard D. Hutchinson, Charles T. Keys, and Winard L. Wilhoyte, Columbus, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed May 15, 1969, Ser. No. 824,785

Int. Cl. G11c *9/00*

U.S. Cl. 340—172.5 **21 Claims**

The invention comprises a steering and distribution circuit which permits data to be transferred over a plurality of busses from registers to an electronic type data receiving circuit, such as a tape recorder, at a relatively high rate via the contacts of steering relays associated with each bus. The improvements reside in (1) circuitry for operating the steering relays of each bus prior to the time that data is to be applied via the contacts of an operated relay to the recorder, and (2) circuitry in both the register and the recorder which provides an indication that



all of the registered data has been transferred to the recorder.

3,560,939

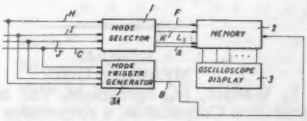
DIGITAL CHANNEL SELECTION APPARATUS

József Lukács, Budapest, Hungary, assignor to Kozponti Fizikai Kutato Intezet, Budapest, Hungary, a firm

Continuation-in-part of application Ser. No. 541,731, Apr. 11, 1966. This application July 5, 1968, Ser. No. 743,272

Int. Cl. G06f *9/00;* **H03k** *17/00*

U.S. Cl. 340—172.5 **4 Claims**



A selection circuit for exciting one of M digital channels (including one monitoring channel and M–1 operating channels) automatically excites the monitoring chanel upon the de-excitation of any of the operating channels. Each selected operating channel is energized, and the monitoring channel deenergized, by an associated unique one of M–1 switching pulses. The de-excitation of an operating channel and the simultaneous energizing of the monitoring channel is accomplished by the application of a stop pulse to the last-mentioned operating channel.

3,560,940

TIME SHARED INTERCONNECTION APPARATUS

Fritz H. Gaensslen, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

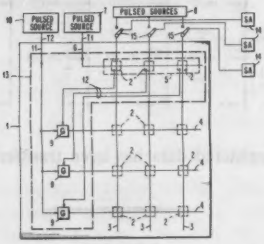
Filed July 15, 1968, Ser. No. 745,026

Int. Cl. G11c *11/40;* **H03k** *3/286*

U.S. Cl. 340—173 **26 Claims**

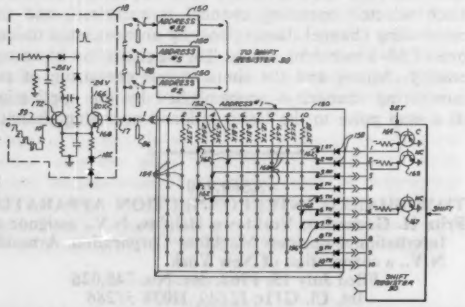
An array of actuable devices each requiring two inputs for actuation is disclosed. During a first time period, one row of the array is separately actuable via common interconnections to columns of actuable devices and a common row connection and stores information in binary form. Each of the devices in the row is connected to a column of actuable devices and to an actuable gate which is actuated or not actuated depending on the state of the actuable devices of the separately actuated row. Each gate is also connected to a separate row of the array. During a second time period, the columns of actuable de-

vices, are actuated from pulsed sources via their common interconnection and from a pulsed source connected in common to all the gates. Since only one gate connected to a row is actuated and all columns of devices are actuated, only those devices in that row are actuated. In a memory environment, the foregoing operation is characterized as writing. To detect the condition of selected of the actuated devices, an actuable gate is selected during a first time period and, during a second time period, sensing devices are connected to the columns of actuable de-



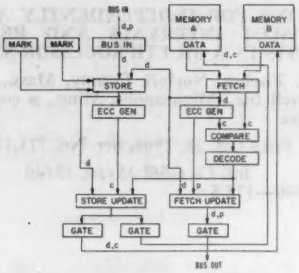
vices and, the common interconnection to a row of actuable devices is activated from a pulsed source. In a memory invironment, the foregoing operation is characterized as reading. The actuable devices may be memory cells, bistable circuits or the like. The arrangement shown is particularly adapted to the semiconductor chip environment where reduction of interconnections is a significant design factor. Other arrangements showing decoding on the chip and more than two time periods are also disclosed.

3,560,941
MEMORY UNIT
Jacob L. Wallace, Jr., Springfield, Va., assignor to The Susquehanna Corporation, a corporation of Delaware
Original application May 28, 1964, Ser. No. 370,780, now Patent No. 3,341,666, dated Sept. 12, 1967. Divided and this application Aug. 29, 1967, Ser. No. 664,084
Int. Cl. G11c *17/00*
U.S. Cl. 340—173 **7 Claims**



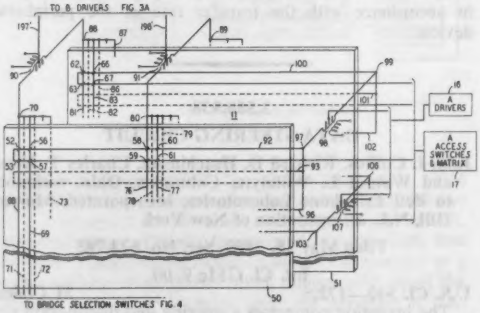
An embodiment of the present invention shows a circuit board used in the memory of a repertory dialer. The board has ten columns of electrically-connected sockets, each column being headed by a resistor weighted in value according to the column in which it is located. Each column corresponds to a digit value in an address. Ten rows, having a socket in each row, are also provided and correspond to the digit positions in an address. To program the circuit board, a wire lead is connected from the socket in each row to a socket in the column corresponding to the digit value. This board therefore permits the programming of information directly in analog form. The memory, comprising a plurality of boards, stores three-dimensional information in a two-dimensional matrix. The weighted resistors provide the third-dimensional information.

3,560,942
CLOCK FOR OVERLAPPED MEMORIES WITH ERROR CORRECTION
Cornelius J. Enright, Jr., La Grangeville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y., a corporation of New York
Filed July 15, 1968, Ser. No. 745,010
Int. Cl. G11c *7/00*
U.S. Cl. 340—173 **7 Claims**



This disclosure teaches a clock circuit that can be shared by several memories. The clock controls the memories to operate in an overlapping mode and to share error correction circuitry and other common circuits.

3,560,943
MEMORY ORGANIZATION FOR TWO-WAY ACCESS
Philip A. Harding, Aurora, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York
Filed Jan. 29, 1968, Ser. No. 701,172
Int. Cl. G11c *5/04, 7/00, 11/06*
U.S. Cl. 340—174 **21 Claims**



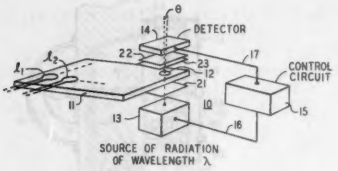
A magnetic store system is organized on a 2-wire single-storage-element-per-bit basis for coincident current read and write. Sensing circuits are coupled to the memory along two different coordinates so that readout is realized along either of such two coordinates.

3,560,944

FARADAY ROTATION DEVICE

Arjeh J. Kurtzig, Short Hills, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed Aug. 14, 1969, Ser. No. 850,066
Int. Cl. G02f 1/22, 1/24; G11c 11/14
U.S. Cl. 340—174 9 Claims



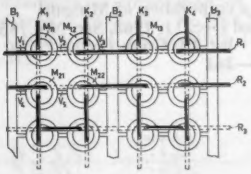
Useful Faraday rotation in magnetic birefringent crystals is shown to be increased if incident radiation propagates in the plane defined by the magnetization and the optic axis of the crystal in a direction nonparallel to the magnetization.

3,560,945

MAGNETIC STORAGE DEVICE

Hermanus Johannus Maria de Haan, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y., a corporation of Delaware

Filed Sept. 2, 1969, Ser. No. 854,380
Claims priority, application Netherlands, Sept. 18, 1968, 6813303
Int. Cl. G11c 5/04, 11/06
U.S. Cl. 340—174 2 Claims



Magnetic storage device comprising a plurality of apertured storage elements of magnetic material connected by parts of the same material to form a mechanically integral body, control-conductors being passed through the apertures of the elements so that currents through the conductors can affect only the elements coupled with the conductors due to the arrangement of the connecting parts whereby no magnetic flux can occur along the connecting parts.

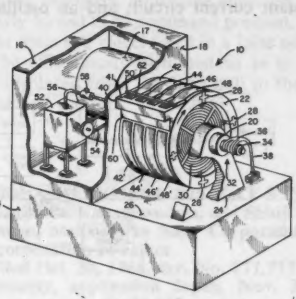
3,560,946

ROTATING-HEAD MEMORY SYSTEM UTILIZING NON-CONTACTING FLEXIBLE RECORD MEMBER

Gregory J. Ehalt, Long Lake, George D. Bukovich, Minneapolis, and Willard C. Neuman, St. Paul Park Village, Minn., assignors to Sperry Rand Corporation, New York, N.Y., a corporation of Delaware

Filed Jan. 3, 1968, Ser. No. 695,500
Int. Cl. G11b 21/02, 5/60
U.S. Cl. 340—174.1 16 Claims

A memory system having magnetic transducers mounted in a rotatable support member for cooperating with flexible record members is described. A system for mounting the transducer selection circuits within the rotatable support member is also described. The rotatable support member supports the flexible record members on a boundary layer of air, and a record member profile correction system ensures that the flexible record members are uniformly positioned to cooperate with the moving transducers.

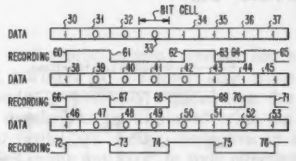


3,560,947

METHOD AND APPARATUS FOR COMMUNICATION AND STORAGE OF BINARY INFORMATION

Robert Chester Franchini, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed May 31, 1968, Ser. No. 733,475
Int. Cl. G11b 5/04, 5/44
U.S. Cl. 340—174.1 8 Claims



Method and apparatus for communication and storage of binary information on a medium having two separately identifiable waveforms or states and having a plurality of nearly uniform bit cells. Binary "ones" are transmitted in selected bit cells by writing a transition between the two states at the center of each such bit cell. Binary "zeroes" are transmitted in all other bit cells by writing a transition between the two states at the leading edge of only those of the "zero" bit cells not immediately following a bit cell having a transition therein. Separation of data is accomplished by viewing each bit cell and separating any transition detected at the center of a bit cell as a "one" and considering any other bit cell as a "zero."

3,560,948

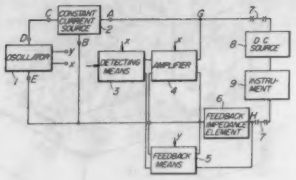
SIGNAL TELEMETERING SYSTEM USING PAIR TRANSMISSION LINES

Fumiyuki Inose, Hachioji-shi, and Kazuo Takasugi, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan, a corporation of Japan

Filed Dec. 17, 1968, Ser. No. 784,363
Claims priority, application Japan, Dec. 22, 1967, 42/81,872; Dec. 27, 1967, 43/83,224; Jan. 10, 1968, 43/1,088, 43/1,089, 43/1,090; Feb. 5, 1968, 43/6,694; Mar. 8, 1968, 43/14,661
Int. Cl. G08c 19/02
U.S. Cl. 340—186 8 Claims

A system for telemetering input data such as temperature which comprises: a detector operatingly converting the input data into electric signal; an amplifier for

amplifying and transmitting the electric signal through negative feedback means, and a pair of transmission lines to a measuring instrument; a D.C. power source for supplying D.C. voltage through the transmission lines to a constant current circuit; and an oscillator for generating a rectangular wave to control the detector, amplifier and the feedback means so that a spike voltage involved in the rectangular wave produced by the oscillator is prevented from being transmitted to the instrument through the transmission lines.

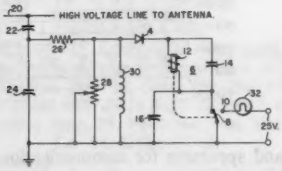


3,560,949

THRESHOLD CIRCUIT FOR DETECTING AND INDICATING AN OVERVOLTAGE

Harvey M. Masters, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed June 27, 1968, Ser. No. 740,756
Int. Cl. G08b *21/00*
U.S. Cl. 340—248 **8 Claims**



A threshold circuit for detecting and indicating an overvoltage. An example being to sense the voltage at an antenna being fed from a transmitter through an antenna coupler. A switching contact and an operating coil therefore are connected in a series circuit combination with a first capacitor connected across the operating coil. After the first capacitor charges to approximately the peak of the voltage being monitored, current through the operating coil will be sufficient to actuate the switching contact should the sensed voltage exceed the predetermined threshold value. After actuation of the switching contact, the operating coil and first capacitor are disconnected from the voltage to be sensed whereupon the first capacitor discharges through the operating coil to maintain the switching contact in its actuated position until the discharge current is less than the hold-in current requirement of the operating coil. The switching contact will then return to its normal position and as long as the voltage to be sensed remains above the threshold level, the operating coil will be alternately energized and deenergized through the action of the switching contact.

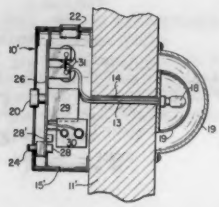
A second capacitor may be advantageously connected across the switching contact to momentarily draw current through the operating coil from the overvoltage source to allow the switching contact to complete its switching cycle without chattering.

3,560,950

WARNING SIGNAL FOR SWINGING DOORS

Duane Peters, Minneapolis, Minn., assignor of one-half to Merrill L. Peters, Rockford, Ill.

Filed Mar. 2, 1967, Ser. No. 620,125
Int. Cl. G08b *13/18*
U.S. Cl. 340—258 **4 Claims**



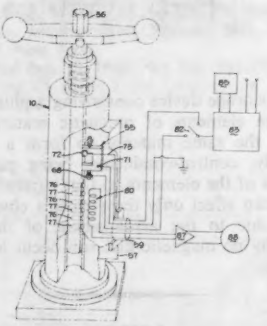
A warning signal provided on one side of a swingable door is operable by automatic means provided on the other side of the door, to warn a person on the signal side of the presence of a person near enough to the other side for opening the same even before the door is actually being opened, whereby to prevent accidental forcible contact with the door, operation of the signal being either by casting a shadow on a light sensitive photo-electric cell or by a thermal responsive switch on a door knob or door plate.

3,560,951

SWITCH FOR SIGNALLING VIBRATIONS AND WHEEL BALANCE TESTER INCORPORATING SAME

David E. Rigall, Pontiac, Mich., and Daniel Eaton, Wentzville, Mo., assignors to The Metalife Company, Wentzville, Mo., a corporation of Missouri

Filed Dec. 11, 1968, Ser. No. 783,080
Int. Cl. G08b *19/00, 21/00*
U.S. Cl. 340—261 **10 Claims**

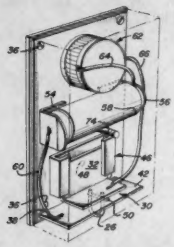


A switch signals small amplitude vibrations of a mechanical element movable over a much greater range. A magnet element of the switch grasps a slide surface of the movable mechanical element to vibrate with it within closely confined limits, but if the mechanical element moves through a greater amplitude, it slides relative to the magnet switch element. As applied to apparatus for detecting the unbalance of the vehicle wheels, the magnet switch element slidably grasps onto the side surface of a spring-suspended shaft which may be depressed to fit against the under side of a vehicle at any convenient height.

3,560,952
DOOR NIGHT CHAIN WITH ALARM

Robert D. Wilson, 1040 N. Juniper, Coquille, Oreg. 97423

Filed Mar. 8, 1968, Ser. No. 711,650
Int. Cl. G08b *13/08*
U.S. Cl. 340—274 2 Claims

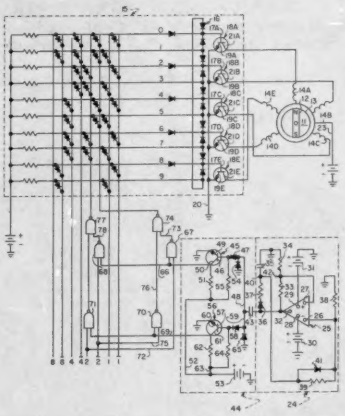


A guide assembly to be supported from a door and having a slide member supported therefrom for limit rectilinear reciprocation and engageable with a stop for defining one limit position of movement, the stop and the slide being interposed in an electrical signalling device circuit for closing the circuit when in contact with each other and the slide comprising an anchored end of a door night chain.

3,560,953
CONTROL MEANS FOR AN ELECTROMAGNETIC INDICATOR DEVICE

Frederick B. Sylvander, Rutherford, N.J., assignor to The Bendix Corporation, a corporation of Delaware

Filed Sept. 5, 1968, Ser. No. 757,717
Int. Cl. G08b *5/14, 29/00;* H01b *47/20*
U.S. Cl. 340—319 10 Claims

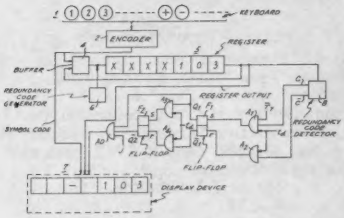


Control means for an electromagnetic indicator device of a type including an electrically actuated magnetic indicator wheel for positioning discrete numbers or symbols on a rotating drum by electrical signals selectively applied to energize controlling electromagnet windings and including in the control of the energization thereof a means to prevent intermittent "hang-up" in selectively positioning indicia on the drum so that the drum may be angularly displaced one hundred and eighty degrees upon the application of a controlled energization of the electromagnetic windings effecting a disturbing torque for introducing a momentum into the magnetic wheel which will have negligible noticeable effect on the wheel when angularly turned to its command position, but which will cause the magnetic wheel when in a false null angular position to be efficaciously disturbed so as to cause the wheel to be displaced from the false null to the true null angular command position.

3,560,954
NUMBER AND SYMBOL DISPLAY SYSTEM

Yuzuru Yanagisawa, Kanagawa-ken, and Shinji Kusunoki, Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan, a corporation of Japan

Filed Oct. 30, 1968, Ser. No. 771,717
Claims priority, application Japan, Nov. 2, 1967, 42/70,427
Int. Cl. G06k *15/18*
U.S. Cl. 340—324 15 Claims



In a number and symbol display system for a computer, the digit portions of a register are sequentially supplied with codes respectively representing the digits of an effective number to be displayed with the codes representing any futile "0's" being distinctive in respect to the codes representing any "0's" in such effective number, a display device responds to the sequentially supplied output of the register to display at its respective digit portions the digits of the effective number represented by their respective codes in the register output and avoids the display of any futile "0's" represented by their distinctive codes, the distinctive code in the register output is detected and, in response to such detection, a control output signal is supplied to a display device at a digit time position that is one or two digit times later than that of the most significant digit of the effective number as determined by the detected distinctive code to cause the display device to display the symbol represented by a supplied symbol code in the digit portion of the display device that is one or two digit positions higher than that of the digit portion displaying the most significant digit of the displayed effective number.

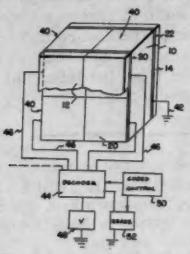
3,560,955
BIREFRINGENT DISPLAY SYSTEMS

Robert W. Hallman, St. Clair Shores, Mich., assignor to Teeg Research, Inc., Detroit, Mich., a corporation of Delaware

Continuation of application Ser. No. 611,101, Jan. 23, 1967. This application Dec. 30, 1968, Ser. No. 787,952
Int. Cl. G02f *1/24*
U.S. Cl. 340—324 33 Claims

Optical elements for display systems and the like, utilizing a material capable of exhibiting optical birefringence when placed under stress or strain, provided with different arrangements for locally placing the material under stress by means of electrostriction, magnetostriction, heat distortion, etc., such that the stressed

portions of the material acts as variable retardation plate or variable polarizer and display a different color from



the color displayed by unstressed portions when polarized light is passed through the material and observed through an analyzer.

3,560,956

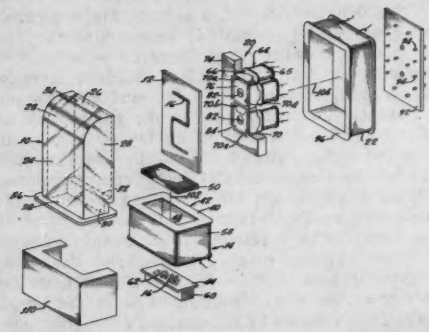
IMAGE FORMING APPARATUS

Richard C. Sinnott, Menlo Park, Calif., assignor to Sinnott Company, San Mateo, Calif., a California limited partnership

Continuation-in-part of application Ser. No. 565,353, July 11, 1966, which is a continuation-in-part of application Ser. No. 511,707, Dec. 6, 1965, both now abandoned. This application July 5, 1967, Ser. No. 651,240

Int. Cl. G09b *9/30*

U.S. Cl. 340—324 **33 Claims**



An image forming device such as a display device includes a particle accelerator which forms a transparent cloud of particles adjacent a display surface. The particles are attracted from the cloud to the display surface in a desired pattern by a unidirectional field of force. The particle accelerator inludes an alternating electromagnet and a screen dividing the enclosure into two chambers. Particles too large to pass through the screen are retained in the chamber away from the display surface, and are accelerated by the alternating field. Smaller particles cling to the larger ones and are jarred loose when the larger particles strike the sceen. The smaller particles then pass through the screen at a high velocity to form the transparent cloud adjacent the display surface.

In one embodiment the unidirectional field is created by D.C. electromagnets. In another embodiment the particles are electrostatically charged and the display surface is oppositely charged by an electron gun to attract the particles to the surface in the desired pattern.

3,560,957

SIGNAL CONVERSION SYSTEMS WITH STORAGE AND CORRECTION OF QUANTIZATION ERROR

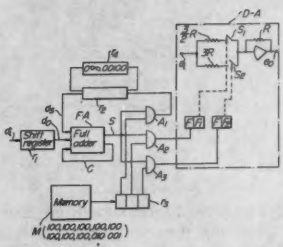
Takeo Miura, Kokubunji-shi, and Junzo Iwata, Kodaira-shi, Japan, assignors to Hitachi, Ltd., and Hitachi Electronics Company, Ltd., both of Tokyo, Japan, both corporations of Japan

Filed Jan. 23, 1967, Ser. No. 611,030

Claims priority, application Japan, Jan. 26, 1966, 41/4,050, 41/4,051; Mar. 16, 1966, 41/15,794; May 2, 1966, 41/27,589

Int. Cl. H03k *13/04, 13/17*

U.S. Cl. 340—347 **6 Claims**



Digital to analog and sample-hold circuits in which conversion or quantization error generated in each sampling or conversion interval is stored and added to the next consecutive input signal for conversion therewith. The digital to analog converter includes a conventional converter having a capacity of n bits, for conversion of the n most significant bits of an $n+i$ bit input signal. The i unconverted bits are added in a full adder to the next digital input. The sample-hold device includes apparatus for measuring and integrating the difference between the sampled output and the analog input signal during a first sampling interval. The integrated value is then added to the analog input signal during the next sampling interval.

3,560,958

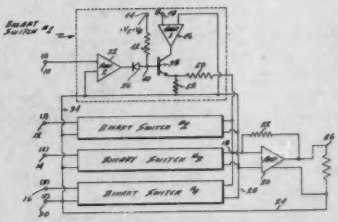
ELECTRICAL SWITCHING SYSTEM

Noel B. Braymer, Costa Mesa, Calif., assignor to Dana Laboratories, Inc., Irvine, Calif., a corporation of California

Filed Jan. 30, 1967, Ser. No. 612,609

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 **2 Claims**



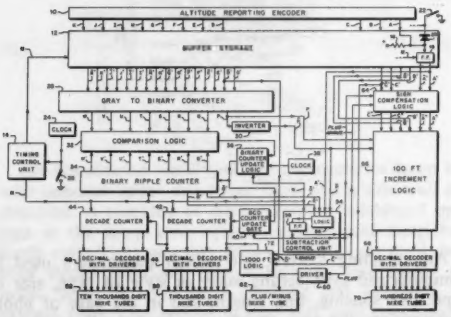
This application discloses the use of a single transistor of either the NPN or the PNP type interconnected and biased for use as a switch in a diigtal-to-analog converter. A plurality of such transistor switches are used in conjunction with individual logic amplifiers to control the state, "off" or "on," of the transistor switch so as to cause the transistor switch to apply a representative current signal (through variation in gain of each transistor) to a summing junction or to isolate the summing junction from the current source. Where representative currents are from several switches and are summed to develop a composite analog signal, the point of summation is held at

"virtual ground" through the use of an "operational amplifier." Each of the transistor switches are operated in the inverted mode, that is, the collector of the transistor is operated as the dominant emitter.

3,560,959
READOUT DEVICE FOR ALTITUDE REPORTING ENCODER

John M. K. Bergey, Ann Arbor, Mich., assignor to the United States of America as represented by the Secretary of the Navy

Filed Mar. 22, 1967, Ser. No. 625,921
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 **8 Claims**



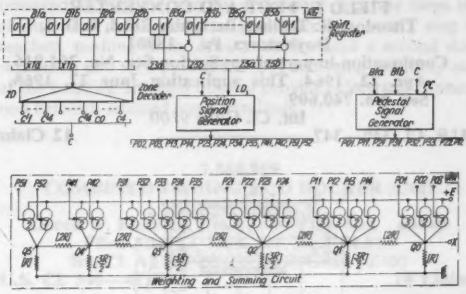
A readout device for visually displaying in decimal form the output of an altitude reporting encoder whose eleven parallel digital output signals are coded in the Moa-Gilham code and are indicative of a particular altitude increment within a range extending to levels above and below sea level. The readout device includes special logic circuitry, having an essentially asynchronous mode of operation, for decoding the three least significant output signals of the encoder into a signal for activating the visual display of a hundreds digit for the particular altitude increment being reported. The device also includes a Gray to binary converter, having an essentially asynchronous mode of operation, for converting the eight most significant output signals of the encoder into a binary signal. Circuitry, which operates basically in a synchronous mode, is provided for decoding a more significant portion of the binary signal of the converter and providing an output signal for the activation of a visual display of a thousands digit and a ten thousands digit for the altitude increment being reported by the encoder. Special subtraction control circuitry and logic circuitry are included in the converter decoding circuitry to insure that the proper thousands digit will be displayed. Other circuits are provided for updating the visual display at a flickerless rate, for testing the encoder to see that it is operating and for selectively holding a given visual display when the encoder reported altitude is changing rapidly.

3,560,960
NONLINEAR TERNARY DECODER

Michel L. Avignon, Neuilly-sur-Seine, France, and Joseph L. Mader, Dietlikon, Switzerland, assignors to International Standard Electric Corporation, New York, N.Y., a corporation of Delaware

Filed Dec. 22, 1967, Ser. No. 692,929
Claims priority, application France, Dec. 29, 1966, 89,324
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 **10 Claims**

The nonlinear characteristic of the decoder is approximated by a plurality of differently sloped straight line segments and each ternary condition is represented by a different pair of binary digits. A first signal, produced by the most significant ternary digits of a code group, indicates the minimum voltage of the segment containing the code group. A second signal, produced in response

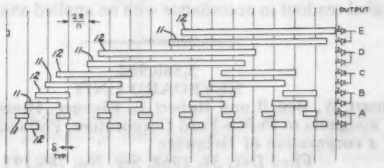


to at least the least significant digits of the code group, indicates the position of the code group along said segments. A weighting and summing circuit responds to these two signals to produce the decoder output.

3,560,961
HIGH ACCURACY MULTITURN DIGITAL ENCODER

John L. Mueller, New York, N.Y., assignor to Collectron Corporation, New York, N.Y.

Filed July 3, 1967, Ser. No. 650,881
Int. Cl. H03k *13/00;* **G08c** *9/00*
U.S. Cl. 340—347 **2 Claims**

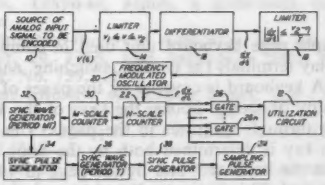


A multiturn digital encoder of the type in which a first drum or disc is rotated *n* integer revolutions for each revolution of a second drum or disc, in which the accuracy of the code pattern on the faster moving directly driven drum is superimposed upon that of the slower moving drum to eliminate ambiguity and the need for electronic circuitry to correct the same.

3,560,962
ANALOG-TO-DIGITAL ENCODER

William C. G. Ortel, New York, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

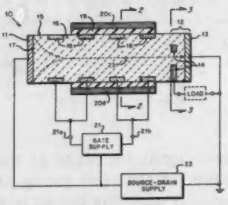
Filed Mar. 6, 1968, Ser. No. 710,959
Int. Cl. H03k *13/20*
U.S. Cl. 340—347 **5 Claims**



The modulated output of a variable-frequency oscillator included in an analog-to-digital encoder is processed to

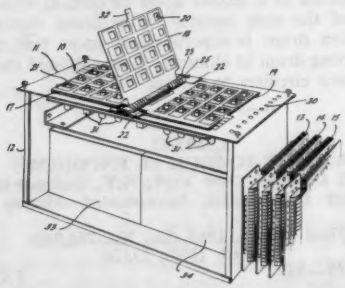
abstract therefrom signals for synchronizing the operation of a sampling pulse generator included in the encoder.

3,560,963
FIELD EFFECT A/D CONVERTER
Theodore R. Trilling, Berkshire Road, R.D. 3, Doylestown, Pa. 18901
Continuation-in-part of application Ser. No. 361,916, Apr. 22, 1964. This application June 27, 1968, Ser. No. 740,609
Int. Cl. G08c 9/00
U.S. Cl. 340—347 **12 Claims**



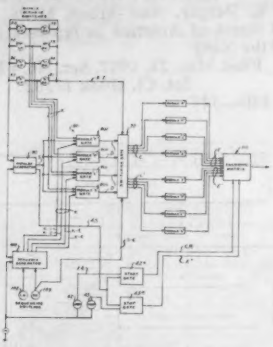
A unipolar, field effect, solid state device of either the junction gate or MOS type is configured as an analog-to-digital converter. Each device comprises an elongated cylindrical channel having a source and drain at opposite ends thereof and a plurality of annular gates circumscribing the channel at spaced intervals along its length to finely constrain a beam of charged carriers. Horizontal and vertical deflection plates are positioned to modulate the beam and cause it to scan a metallized matrix for digital readout in accordance with an applied analog signal.

3,560,964
KEYBOARD UNIT
Stuart W. Bedell and Robert L. Clenner, Houston, Tex., assignors to Philco-Ford Corporation, Philadelphia, Pa., a corporation of Delaware
Filed Dec. 31, 1968, Ser. No. 788,193
Int. Cl. G08c 9/00
U.S. Cl. 340—365 **10 Claims**



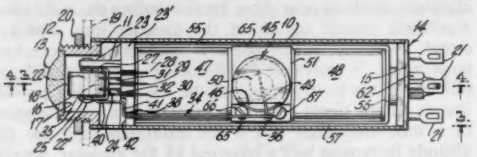
A multiple page keyboard unit used in computer oriented display terminals for control, switching, and similar purposes. A keyboard is covered by the pages of any one of a plurality of special books, the keys of the keyboard protruding through apertures in the pages. The function of a given key is determined both by the book which is in place on the keyboard, and by the page to which that book is opened. This is accomplished by an arrangement of switch means which senses both the identity of the book and the page to which the book is opened.

3,560,965
SEQUENCING COMMAND ENCODING GENERATOR
Russell P. White, Jr., and J M Gregory, Dallas, Tex., assignors to Taylor Publishing Company, Dallas, Tex., a corporation of Texas
Filed Oct. 28, 1968, Ser. No. 771,144
Int. Cl. H04g 3/00
U.S. Cl. 340—365 **11 Claims**



An encoding system into which parameters used in computerized type setting such as style of type, size of type, line spacing, line length, and in the case of photo composition, the amount of space between lines of type, may be preset and punched into a tape by a single keystroke.

3,560,966
ELECTROMAGNETICALLY OPERATED DISPLAY DEVICE
Norman D. Deshler, Belvedere, N.J., and Gereld L. Tawney, Los Altos Hills, Calif., assignors to Nytronics, Inc., Pelham, Manor, N.Y., a corporation of Delaware
Filed Jan. 29, 1969, Ser. No. 826,033
Int. Cl. G08b 5/24
U.S. Cl. 340—373 **21 Claims**



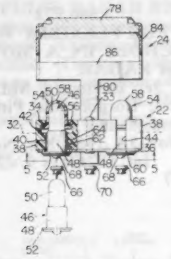
The invention contemplates a display device in which a display member and a permanent-magnet drive member are independently mounted for pivotal oscillation on spaced frame-based axes. Frame-based magnetic core and excitation windings are pulse-actuated to shift the drive member to one or to the other of its two angularly spaced at-rest positions. The polarity of permanent magnetism is such, in terms of the angularly spaced limits of drive-member movement, that the drive member is self-retained at its limit position, without need for excitation. A switch device tracks drive-member movement to reverse the winding excitation connections, thus conditioning the display device for response to the next excitation pulse. For any given actuation, starting resistance is minimized by using lost-motion connection techniques to link the driven member in operative relation with the display member and with the switch device, the arrangement being such that, whatever the direction of actuation, the lost-motion must first be traversed before effective driving torques are imparted to the display member or to the switch device.

3,560,967

LAMP FILTER AND LAMPHOLDER ASSEMBLY

Anthony A. Di Pilla, Philadelphia, Pa., assignor to Robertshaw Controls Company, Richmond, Va., a corporation of Delaware

Filed Jan. 4, 1968, Ser. No. 695,639
Int. Cl. G09f 9/00
U.S. Cl. 340—381 20 Claims



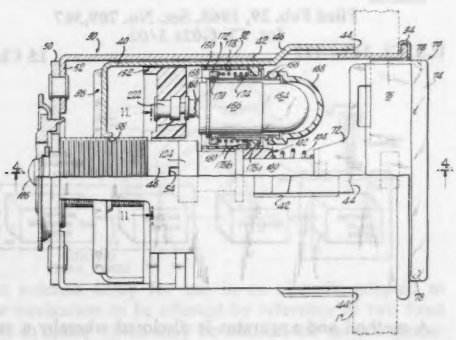
An illuminated signal unit has an insulative lamp base with opposite upper and lower faces and a side wall construction. A plurality of lamp receiving cylindrical openings in the lamp base extend through said lamp base. Each cylindrical opening has a radially outward lamp filter flange receiving groove between said upper and lower faces. A lamp filter inserting and removing slot extends from said groove to said side wall construction. Each opening receives a lamp with a neutral sleeve in said opening, an illuminating lamp bulb extending out of one of said faces, and a live contact flange extending out of the other of said faces. Each of such grooves and cylindrical openings receives a flexible lamp filter with a filter flange in such groove and a filter bulb extending along said cylindrical opening and over the lamp bulb. Each filter can be flexed to be insertable in and removable from such groove through an adjacent slot.

3,560,968

LIGHTED PUSHBUTTON

James H. Andersen, Cheshire, Conn., and Anthony R. Ford, Covina, and Alvin Franklin, Whittier, Calif., and Howard M. Siegel, Long Beach, N.Y., assignors, by mesne assignments, to Unimax Switch Corporation, a corporation of Connecticut

Filed May 4, 1967, Ser. No. 636,214
Int. Cl. G09f 9/00
U.S. Cl. 340—381 24 Claims



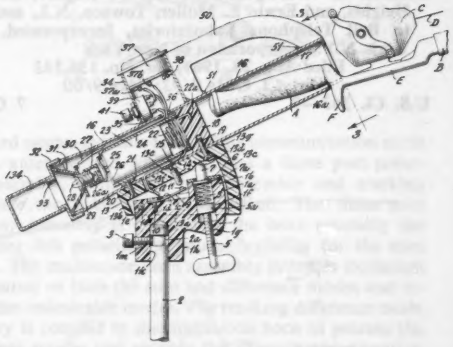
A pushbutton, adapted to provide a signal upon depression of the frontwardly extending lens assembly, is mounted on a panel by means of a multilegged clamping member. To mount the device, the clamp is axially displaced toward the rear panel surface by single lead screw disposed within the pushbutton housing. The screw is accessible from the front of the panel. The lamp and lens assembly contain individually spring biased lamps and is removed as a single unit by a series of separate steps including first pulling out the lens assembly until a stop is reached, pushing in the lens assembly until a second stop is reached and then pulling the lens and lamp assembly out of the housing. Internal bussing provides electrical connection between selected lamp terminals.

3,560,969

COMBINED FISHING ROD HOLDER AND SIGNAL DEVICE

Darell W. Fleeman, Rte. 1, Fair Play, Mo. 65649

Filed Aug. 23, 1968, Ser. No. 754,813
Int. Cl. A01k 97/10, 97/12; G08h 71/00
U.S. Cl. 340—421 18 Claims



A novel combined fishing rod holder and signal means which will provide the fisherman with a device which will hold his fishing rod for him, the device being swivelly mounted on a stake or the like driven into the bank close to the water, or mounted on a boat while fishing from a boat, the device having means which will signal the fisherman that a fish is biting or is caught on the hook and line by a visible light signal, an audible sound signal, or by both at the same time, the device being positioned so as to swivel on the support stake, allowing the fisherman at night to determine the direction in which the fish is biting on the line so that the fisherman can manipulate his rod and set the hook in the fish's mouth. Alternatively, the support stake can be fitted into a bracket or clamp fastened to a boat.

3,560,970

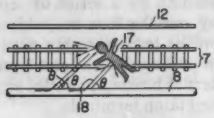
OBSTACLE DETECTOR UTILIZING WAVEGUIDE

Masao Kamimura and Mitsuru Watanabe, Tokyo-to, Japan, assignors to Kabushiki Kaisha Hitachi Seisakusho, Tokyo-to, Japan, a joint-stock company of Japan

Continuation-in-part of application Ser. No. 449,556, Apr. 20, 1965. This application Sept. 13, 1968, Ser. No. 759,712
Claims priority, application Japan, Apr. 30, 1964, 39/24,227, 39/24,228
Int. Cl. H01q 13/22; B61l 23/00; G01s 9/02
U.S. Cl. 343—5 9 Claims

An obstacle detecting apparatus comprising a leaky waveguide having beam directivity and leakage aperture installed along one side of the path, electromagnetic waves being supplied through the waveguide, caused to leak out

of the leakage aperture, and reflected when they strike any obstacle in the path and re-enter the waveguide

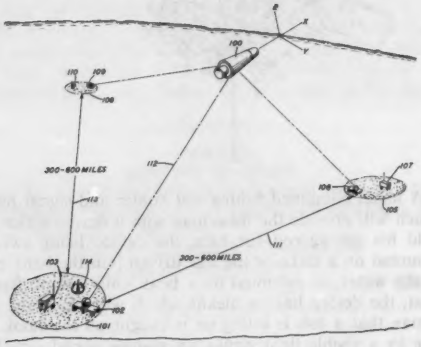


through the leakage aperture to be sensed by an appropriate means to detect the presence and position of the obstacle.

3,560,971
GUIDANCE CONTROL AND TRAJECTORY MEASURING SYSTEM

Dietrich A. Alsberg and Donald R. Hagner, Berkeley Heights, and Erwin E. Muller, Towaco, N.J., assignors to Bell Telephone Laboratories, Incorporated, New York, N.Y., a corporation of New York

Filed Aug. 28, 1961, Ser. No. 136,143
Int. Cl. G01s *9/02*; F41g *9/00*
U.S. Cl. 343—7 **7 Claims**



1. In a guidance system having a tracking station for determining the velocity of an airborne missile, a tracking radar at said station for transmitting signals to said missile, means in said missile responsive to each of said signals for transmitting a responding signal to said tracking radar, means including said tracking radar responsive to each received responding signal for deriving data representing the instantaneous range of said missile, means for differentiating said range data to obtain radar missile velocity data, a Doppler transmitter including an oscillator in said missile, means at said tracking radar responsive to signals received from said Doppler transmitter for deriving Doppler missile velocity data, means smoothing both said radar and said Doppler missile velocity data during substantially equal predetermined periods of time, means deriving the difference between the smoothed radar and Doppler velocity data to obtain error velocity data representative of the frequency drift of said Doppler oscillator, another smoothing means having an effective smoothing perid substantially shorter than the aforesaid predetermined periods to obtain short term smoothed Doppler missile velocity data from said Doppler missile velocity data, and means combining said error velocity data and said short term smooth Doppler velocity data to obtain a more precise missile velocity.

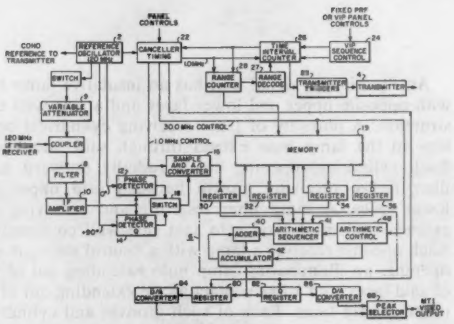
ERRATUM

For Class 343—7.5 see:
Patent No. 3,560,991

3,560,972
APPARATUS FOR FLEXIBLY WEIGHTING RECEIVED ECHOES IN A MOVING TARGET INDICATOR RADAR

John W. Taylor, Jr., Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Nov. 18, 1968, Ser. No. 776,410
Int. Cl. G01s *9/42*
U.S. Cl. 343—7.7 **4 Claims**

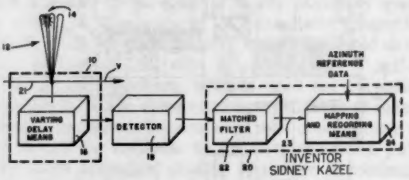


A moving target indicator radar system permitting not only flexibility and choice of the interpulse period but also flexibility in the weighting of the pulses. The last received echo pulse and a sequence of previous pulses are provided weighting factors in an arithmetic unit of the radar receiver to provide the benefits of variable interpulse periods without sacrifice of the shape of the clutter notch reception. The weighting factors are selected to be binary in relationship to simplify the arithmetic unit.

3,560,973
METHOD AND APPARATUS FOR PASSIVE MAPPING

Sidney Kazel, Chicago, Ill., assignor to IIT Research Institute, Chicago, Ill., a not-for-profit corporation of Illinois

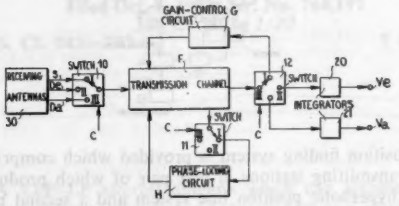
Filed Feb. 29, 1968, Ser. No. 709,367
Int. Cl. G02s *5/02*
U.S. Cl. 343—112 **15 Claims**



A method and apparatus is disclosed whereby a number of radiation emitters may be passively mapped by moving a sensor means having a multilobed receiving pattern past the emitters so that the envelope of the signal received therefrom fluctuates in accordance with

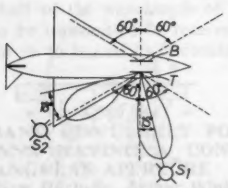
the lobe structure of the pattern. The relative time of arrival of the signal is determined to provide an indication of the emitter azimuth, and the relative elongation of the received signal is determined to provide an indication of the emitter range.

3,560,974
SIGNAL-CHANNEL EVALUATION NETWORK FOR MONOPULSE RADAR RECEIVER
Jean-Claude Lecourtier, Vitry-sur-Seine, and Fernand Jean-Maurice Puverel, Antony, France, assignors to Compagnie Francaise, Thomson Houston-Hotchkiss Brandt, Paris, France, a corporation of France
Filed Jan. 7, 1969, Ser. No. 789,514
Claims priority, application France, Jan. 9, 1968, 135,358
Int. Cl. G01s *9/22*
U.S. Cl. 343—16 **14 Claims**



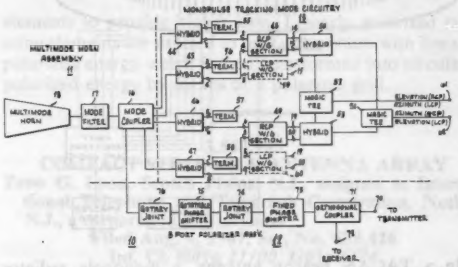
Sum and difference signals from an array of receiving antennas of a monopulse-type radar system are sequentially transmitted to an output stage through a single-channel evaluation network. The sum signals, upon comparison with a reference oscillator, set a gain-control circuit and a phase-locking circuit which remains set during the subsequent transmittal of difference signals, voltages to the output stage.

3,560,975
AIRCRAFT ANTENNA SYSTEM FOR AERIAL NAVIGATION
Bertrand Claude Marcel Jean Manuali, Villiers-sur-Orge, France, assignor to Centre National d'Etudes Spatiales, Paris, France, a company of France
Filed Mar. 1, 1968, Ser. No. 709,764
Claims priority, application France, Mar. 2, 1967, 97,202; Mar. 30, 1967, 100,850; July 27, 1967, 115,934
Int. Cl. B64g *3/00*
U.S. Cl. 343—100 **7 Claims**



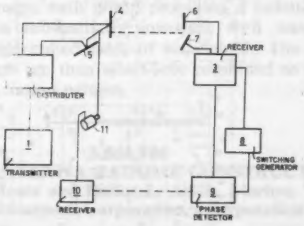
An antenna array for use in an aircraft, adapted to allow navigation to be effected by reference to two fixed points in space which may be outside the earth's atmosphere, comprising two dual lateral antennas, one dual antenna for each side of the aircraft, each antenna incorporating a transmission section and a receiving section, which sections are fixed relative to the aircraft, means being provided whereby the radio beams emitted (and received) by said antennas are capable of orientation by virtue of electronic scanning techniques, towards the respective fixed points of reference.

3,560,976
FEED SYSTEM
Peter Foldes, Montreal, Quebec, Canada, assignor to RCA Corporation, a corporation of Delaware
Filed Aug. 21, 1968, Ser. No. 754,373
Int. Cl. H04b *7/10;* **H01q** *13/02, 15/24*
U.S. Cl. 343—100 **17 Claims**



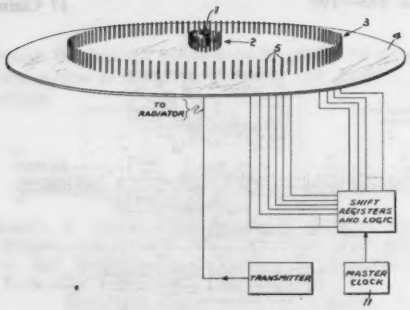
A feed system suitable for satellite communication earth station antennas and which includes a three port polarizer assembly, multimode horn assembly and tracking difference mode circuitry is described. The three port polarizer assembly is coupled to the horn assembly for providing full polarization mode flexibility for the sum modes. The multimode horn assembly provides excitation and control of both the sum and difference modes and inhibits the undesirable modes. The tracking difference mode circuitry is coupled to the multimode horn to process the difference modes and provide the azimuth and elevation information for monopulse tracking.

3,560,977
AERIAL FOLLOWER DEVICE
Jacques Cayzac, Val de Marne, France, assignor to U.S. Philips Corporation, New York, N.Y., a corporation of Delaware
Filed Apr. 3, 1969, Ser. No. 813,232
Claims priority, application France, Apr. 9, 1968, 147,443
Int. Cl. G01s *1/04*
U.S. Cl. 343—100 **4 Claims**



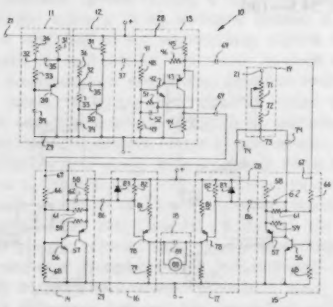
A transmitter has an antenna that has two sections which transmit horizontally and vertically polarized radiation with a 90 degree phase shift. A receiver has an antenna which has two sections for receiving vertically and horizontally polarized radiation. By comparing the phase of the received radiation, the transmitter antenna is pointed towards the receiver.

3,560,978
ELECTRONICALLY CONTROLLED ANTENNA SYSTEM
Leon Himmel, Upper Montclair, Sven H. Dodington, Mountain Lakes, and Ernest G. Parker, Convent Station, N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J., a corporation of Delaware
Filed Nov. 1, 1968, Ser. No. 772,686
Int. Cl. G01s 1/48
U.S. Cl. 343—106 3 Claims



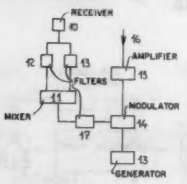
In a TACAN beacon antenna, a monopole radiator surrounded by two or more concentric circular arrays of parasitic elements, which elements are digitally inhibited in sequence in a predetermined manner, is used to produce a rotating radiation pattern capable of producing 15 and 135 cycle-per-second signals at a receiver. Parasitic elements are inhibited by being open circuited by digitally controlled switching diodes. Recirculating shift registers are used to inhibit parasitic elements in the circular arrays to produce the required modulation radiation pattern. A common clock is used to step said registers along to produce the desired rotating pattern.

3,560,979
METHOD AND ELECTRICAL CIRCUIT FOR PROCESSING AIRPORT RUNWAY LOCALIZER AND GLIDESLOPE INFORMATION
Donald A. Boelter, Indianapolis, Ind., assignor to General Aviation Electronics, Inc., Indianapolis, Ind., a corporation of Indiana
Filed Dec. 2, 1968, Ser. No. 780,491
Int. Cl. G01s 1/16
U.S. Cl. 343—109 6 Claims



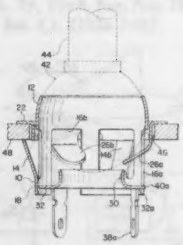
An electrical circuit for processing airport runway localizer or glideslope information having first and second active RC low pass filters connected in series and phase-shifting the demodulated output of a radio receiver to provide the input to a 180° phase splitter having two outputs 180° out of phase, a pair of summing amplifiers, each for summing one of the phase splitter outputs with the demodulated output of the radio receiver, a pair of detectors, one connected to the output of each summing amplifier and an indicator connected between the outputs of the detectors.

3,560,980
POSITION FINDING SYSTEM
Pierre Laurent, Fontenay-aux-Roses, France, assignor to Sercel Societe d'Etudes, Recherches et Constructions Electroniques, Carquefou, France, a French company
Filed Apr. 4, 1969, Ser. No. 813,433
Claims priority, application France, Apr. 11, 1968, 147,733
Int. Cl. G01s 1/34
U.S. Cl. 343—105 1 Claim



A position finding system is provided which comprises four transmitting stations, a first pair of which produces a first hyperbolic position line system and a second pair of which produces a second intersecting hyperbolic position line system. First transmitters of each pair transmit unmodulated high frequency waves in first and second channels respectively and second transmitters of each pair transmit high frequency carrier waves in the first and second channels respectively, each carrier wave being modulated with a degree of modulation less than 1 by a different low frequency. The modulation of the second transmitter of the first pair is equal to the beat frequency of the high frequency unmodulated and carrier waves of the second channel and the modulation of the second transmitter of the second pair is equal to the beat frequency of the high frequency unmodulated and carrier waves of the first channel.

3,560,981
CLIP FOR ANTENNA BALL PORTION
John A. Pestka, Park Ridge, Ill.
(8501 W. Higgins Road, Chicago, Ill. 60631)
Filed Aug. 21, 1969, Ser. No. 851,827
Int. Cl. H01q 1/24
U.S. Cl. 343—702 7 Claims



An antenna mounting assembly for attaching the antenna ball portion to an apertured support panel in resiliently retained but universally mounted position, and for this purpose there is provided a snap-in two-part mounting clip—one part providing a semi-spherical dome portion engaging the antenna ball portion at a first side

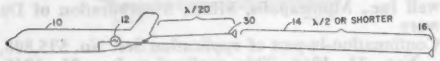
of the panel and including a sleeve portion to pass through the panel aperture and having locking ears to snap behind the panel at the opposite side thereof; and the other part being in the form of a spring tension ferrule flanged to engage the first side of the panel in opposition to the locking ears, and including spring tension arms interfitting with slots in the sleeve portion between the locking ears and in tensioned engagement with the antenna ball portion in opposition to the semispherical dome portion. Adjuncts may include a washer carried by the sleeve portion remote from the ball dome portion with electrical terminal elements, and a ring type spring carried by the tension arms to increase the spring tension thereof against the antenna ball portion.

3,560,982

VLF-LF AIRCRAFT TRAILING ANTENNA

Richard C. Fenwick, Richardson, Tex., assignor to Collins Radio Company, Dallas, Tex., a corporation of Iowa

Filed Oct. 1, 1968, Ser. No. 764,197
Int. Cl. H01q *1/30*
U.S. Cl. 343—707 **7 Claims**



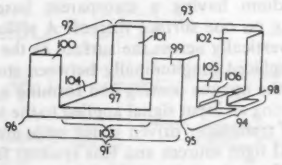
A VLF–LF aircraft antenna which can accommodate a high power transmitter including a first wire of approximately one-half the operating frequency wavelength in length and at least one other wire of approximately one-twentieth the operating frequency wavelength in length.

3,560,983

OMNIDIRECTIONAL LOOP ANTENNA

Edward N. Willie, Locus Valley, N.Y., and Walter K. Volkers, deceased, late of Sand Point, N.Y., by Daphne Volkers, executor, Sand Point, N.Y., assignors to Volkers Research Corp., Port Washington, N.Y., a corporation of New York

Filed Sept. 12, 1967, Ser. No. 667,881
Int. Cl. H01g *7/00*
U.S. Cl. 343—744 **8 Claims**



A single turn loop antenna having a circumference of less than one-half of the wavelength of the electromagnetic energy to be transmitted or received, and an axial dimension from ½ to 1/100 of its circumference.

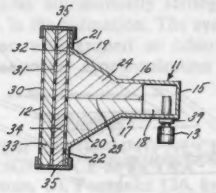
3,560,984

BROADBAND CIRCULARLY POLARIZED ANTENNA HAVING A CONTINUOUS RECTANGULAR APERTURE

Tsze K. Lee, New Rochelle, Arthur Winkler, Bronx, and Wai Wong, Plainview, N.Y., assignors to Loral Corporation, Scarsdale, N.Y., a corporation of New York

Filed Dec. 11, 1968, Ser. No. 783,047
Int. Cl. H01g *15/24, 21/08, 13/02*
U.S. Cl. 343—756 **3 Claims**

A broadband circularly polarized antenna having a continuous rectangular aperture to obtain circular polarization, having uniform phase and tapered amplitude illumination over the broad dimension of the aperture. The device features a larger effective radiating or receiving aperture than comparable rectangular array of circularly polarized spirals due to the use of virtually lossless radiating



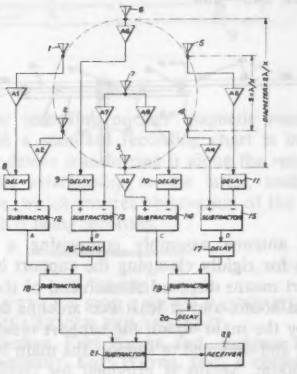
elements to provide higher gain. Linearly polarized radiating elements are utilized to feed an aperture with linearly polarized energy which is then transformed into circularly polarized energy by means of a polarizer grid.

3,560,985

COMPACT STEERABLE ANTENNA ARRAY

Zeno G. Lyon, Scotch Plains, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J., a corporation of Maryland

Filed Aug. 4, 1967, Ser. No. 658,426
Int. Cl. H01q *21/00;* **G01s** *3/74*
U.S. Cl. 343—853 **15 Claims**



A compact, steerable, broad bandwidth antenna array which is capable of providing multiple independent outputs which are utilizable by a plurality of independent receiving systems. The array includes a plurality of relatively closely spaced (i.e., less than one wavelength) antenna elements which are coupled together into groups of antenna elements, each group providing a radiation pattern which is substantially invariant with wavelength above a predetermined value of wavelength. The outputs of these groups are then selectively combined to provide a directive radiation pattern.

3,560,986

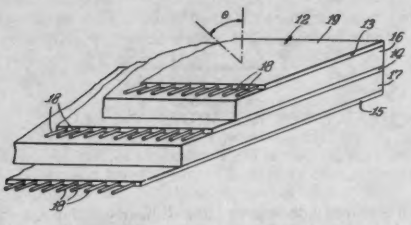
RADAR ANTENNA RADOME CONSTRUCTION

Leonard C. Hoots and Dallas L. Addis, Marion, Va., assignors to Brunswick Corporation, a corporation of Delaware

Filed Feb. 24, 1969, Ser. No. 801,404
Int. Cl. H01q *1/42*
U.S. Cl. 343—872 **17 Claims**

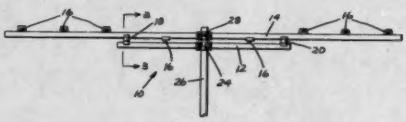
A radar antenna radome construction defining an electromagnetic window for transmitting preselected microwave electromagnetic energy. The construction is defined by a wall structure having at least three spaced high dielectric layers, a low dielectric layer between each pair of

high dielectric layers, and a plurality of parallel electrical conductors in the high dielectric layers. The wall structure is arranged to provide high transmission efficiency



over a wide range of incidence angles, low reflection over a wide range of incidence angles, and low phase delay variation over a wide range of incidence angles.

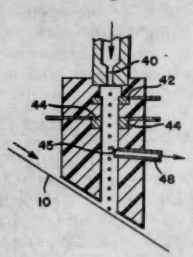
3,560,987
SUPPORT BOOM TO ATTACH PLANAR ARRAY ANTENNA TO MAST
Lynn L. Lockwood, R.D. 3, Burlington, Iowa 52601
Filed May 27, 1968, Ser. No. 732,358
Int. Cl. H01q *1/08*
U.S. Cl. 343—880 **3 Claims**



An antenna assembly comprising a support boom, means for rigidly clamping the support boom to a mast, support means disposed at each end of the support boom, a main boom, and at least one antenna field element carried by the main boom, the support means being proportioned and designed to support the main boom on the support boom. Means is provided for rigidly clamping the main boom to such a mast while the main boom is supported by the support means. In a preferred embodiment of the invention, each of the support means comprises an insulative, H-shaped member, the lower legs of which are proportioned and designed receivably to engage the support boom and the upper legs of which are proportioned and designed receivably to engage a portion of the main boom. Also, preferably, the support boom and main boom have substantially square, or at least rectangular, cross sections and the lower and upper legs of the H-shaped members snugly engage, respectively, the sides of the support boom and the main boom.

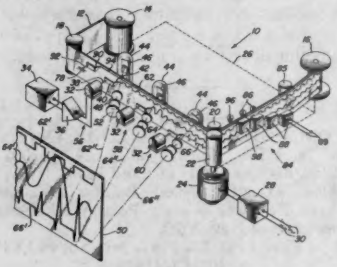
3,560,988
HIGH SPEED PRECISION PLACEMENT OF LIQUID DROPS
Kraig P. Krick, Grove City, Ohio, assignor to The Mead Corporation, Dayton, Ohio, a corporation of Ohio
Filed Oct. 18, 1968, Ser. No. 768,767
Int. Cl. G01d *15/18*
U.S. Cl. 346—1 **7 Claims**

Individual drops are successively projected for deposit in predetermined spaced locations on a receiving member. The drops are projected along a path which intersects the receiving member at an angle arranged to impart a substantial velocity component to the drops in a direction parallel to the direction of relative movement between the drop generator and the receiving member; the drops thus



deposit on the receiving surface in generally circular configuration. The relative movement can result from moving of the receiving member, or the drop projector, or both.

3,560,989
RECORDING AND DISPLAY SYSTEM
Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware
Continuation-in-part of application Ser. No. 595,808, Nov. 21, 1966. This application Jan. 21, 1969, Ser. No. 792,323
Int. Cl. G11b *13/06;* **G01d** *7/06*
U.S. Cl. 346—17 **8 Claims**

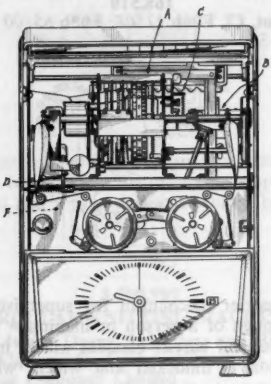


A recording and display system is shown including a recording medium having a transparent base with an opaque coating on one surface thereof. A stylus is transducer driven vertically across the surface as the recording medium is displaced longitudinally between storage reels for removing the opaque coating and forming a recording trace representing an input signal applied to the transducer. A plurality of transducer driven stylus units are arranged with individual light sources and lens systems for projecting the recording trace upon a display screen. Each projected recording trace is identified by color coding and may be displayed in overlapping arrangement upon the display screen. The projected recording traces are also individually manipulated and positioned upon the display screen to provide for time coincidence thereof. Photoelectric cells are provided for reproducing the recording traces at a time remote from the initial recording thereof.

3,560,990
TIME RECORDER
Takayasu Inoue, 838 Rokkakubashi-machi, Kanagawa-ku, Yokahama, Kanagawa Prefecture, Japan
Filed July 22, 1968, Ser. No. 746,352
Int. Cl. G07c *1/14*
U.S. Cl. 346—20 **1 Claim**

In a time recorder of which recording operation is performed by a hammering member actuated through the electromagnetic circuit, a time recording wheel unit including a minute-wheel, an hour-wheel and a day-wheel

which are actuated in a predetermined time sequence, a drive device to actuate said time recording wheels in synchronization with a clock hand, and an interlocking device for interconnecting said day-wheel and a card lifting



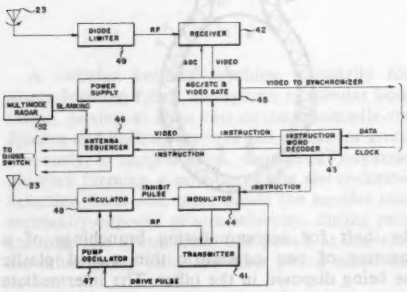
mechanism, whereby no pendulum is required and a compact construction is realized, and said time recorder further including a ribbon shifting device, a power interruption indicating device and a time indicating device.

3,560,991

STATION KEEPING, COLLISION AVOIDANCE AND POSITION FIXING SYSTEM

George E. Beisel, Jr., and Edgar C. Mills, Jr., Marietta, Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Aug. 26, 1968, Ser. No. 755,301
Int. Cl. G01s *9/10*
U.S. Cl. 343—7.5 **12 Claims**



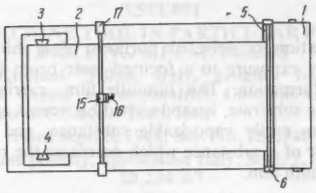
A system for determining the position of one vehicle relative to another by an all-master control technique in which the integrity of the formation of vehicles is independent of the presence of any other member of the formation and no restriction is necessary on the position of any other vehicle in the formation. Time synchronization of all formation members is necessary as time sharing is utilized on a single transmitting frequency and each vehicle beacons only on a time slot division arbitrarily assigned to its identification number. The time synchronization mechanism primarily sets all vehicle system clocks to the same reference instant of T_0 and each transmission occurs at the beginning of the time slot for that particular vehicle. Since each vehicle is assigned an identification number associated with a particular time slot, that vehicle is also identifying itself. Synchronization occurs in a formation by all vehicles automatically setting their clocks to the fastest clock in the formation. The system does not require coordination with ground or other stations external of the formation for synchronization assistance.

3,560,992

DEVICE FOR RECORDING NUCLEAR RESONANCE SPECTRA

Jury Lvovich Kleiman, Ul. Fontanka 126, kv. 25; Nikolai Viktorovich Morkovin, Krasnoputilovskaya ul. 53, kv. 43; and Leonty Ivanovich Koltsov, Ul. Gromova 12, kv. 154, all of Leningrad, U.S.S.R.

Filed Jan. 8, 1969, Ser. No. 789,889
Claims priority, application U.S.S.R., Jan. 12, 1968, 1,209,328
Int. Cl. G01d *9/38*; G01n *27/78*
U.S. Cl. 346—118 **1 Claim**



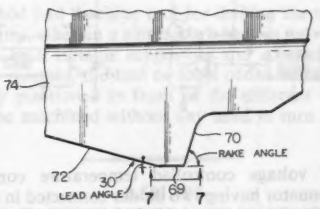
Apparatus for recording nuclear magnetic resonance spectra in which a standard recording chart is inserted into a clamping device transferring it along the recording plane in parallel relationship to the latter, under the action of a drive, which ensures observation of the whole spectrum while it is being recorded.

3,560,993

WRITING STYLUS FOR USE IN FACSIMILE RECEIVER EQUIPMENT

Ernest John Okleshen, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind., a corporation of Delaware

Filed Feb. 24, 1969, Ser. No. 801,670
Int. Cl. G01d *15/20*
U.S. Cl. 346—139 **7 Claims**

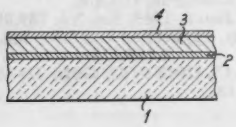


30

This invention relates to an improved stylus which is used in a facsimile receiver having one or more writing styli, the writing stylus being of an improved configuration in which the writing tip is of flat rectangular configuration and of a hard composition alloy making it more durable and less likely to produce damage to the inscription surface in the receiver. The writing tip has unique rake and entry angularity so that it can be more easily

matched with its companion stylus, thereby reducing the incidence of phasing problems in the operation of the facsimile receiver.

3,560,994
VAPORIZABLE RECORDING MEDIUM
Karin Wolff and Hansjoachim Hamisch, Berlin, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Feb. 4, 1969, Ser. No. 796,531
Claims priority, application Germany, Feb. 6, 1968, P 15 74 687.9
Int. Cl. G01d *15/34*
U.S. Cl. 346—135 **8 Claims**

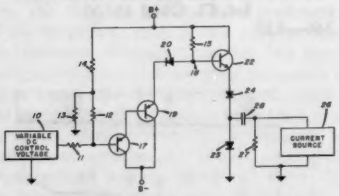


Vaporization of selected portions of a thin film of bismuth by exposure to a focused laser beam is used to record information. The bismuth film, carried on an appropriate substrate, is sandwiched between a supporting layer of an easily vaporizable substance, and a superposed layer of a substance which decreases the reflectivity of the bismuth film.

ERRATA

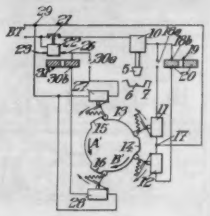
For Classes 307—229 thru 340—379 see:
Patent Nos. 3,560,995 thru 3,561,008

3,560,995
VOLTAGE CONTROLLED MONOLITHIC AUTOMATIC GAIN CONTROL ATTENUATOR DEVICE
Frederick C. Zielinski, Glen Burnie, and William Jones, Jr., Baltimore, Md., assignors, by mesne assignments, to the United States of America as represented by the Secretary of the Navy
Filed June 29, 1967, Ser. No. 650,138
Int. Cl. G06g *7/12*
U.S. Cl. 307—229 **2 Claims**



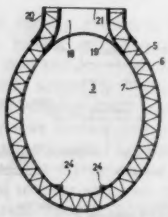
A DC voltage controlled temperature compensated diode attenuator having two diodes connected in series and operated in a range in which the dynamic impedance of the diodes varies exponentially with respect to the DC control voltage applied across them. A voltage application transistor connected in series with the diodes and three semiconductor components serially arranged and connected across the diode attenuator circuit by way of the voltage application transistor to cause the effective impedance in the attenuator circuit to remain constant regardless of change in temperature by varying the DC voltage applied to the voltage application transistor in response to temperature changes affecting the attenuator.

3,560,996
CHECK BARRIER MECHANISM
Bernard Berl, Paris, France, assignor to Etablissements Georges Klein, Paris, France, a society of France
Filed Oct. 2, 1969, Ser. No. 863,242
Claims priority, application France, Oct. 2, 1968, 168,519
Int. Cl. E06b *11/08;* **E05b** *65/00*
U.S. Cl. 49—35 **9 Claims**



A check barrier mechanism for supervising the passage therethrough of a person or inanimate object comprises a mechanical barrier element which, in its normal resting position is unlocked and which, when an unauthorized person or object attempts to pass said barrier element, is automatically locked upon initial displacement of said barrier element by said unauthorized object. The mode of operation of the mechanism may be readily varied to suit any one of several applications which include the provision of free passage in one or each direction, prohibited passage in one or each direction and passage subject to the establishment of right of way, by for example payment, in one or each direction.

3,560,997
CABLE SHAFT
Helmut Goldschmidt, Schepsdorf, and Heinrich Baunemann, Munster, Westphalia, Germany, assignors to Industriele Onderneming Wavin N.V., Zwolle, Netherlands
Filed Mar. 5, 1969, Ser. No. 804,617
Claims priority, application Germany, Mar. 12, 1968, P 16 90 537.6
Int. Cl. E04h *5/06;* **H02g** *9/10*
U.S. Cl. 52—20 **10 Claims**

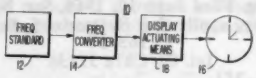


A cable shaft for accommodating branchings of a cable consisting of two concentric thin walled plastic bodies one being disposed in the other. The intermediate space between both bodies contains a reinforcement and a filling mass such as concrete or a foam plastic.

3,560,998
ELECTRONICALLY CONTROLLED TIMEPIECE USING LOW POWER MOS TRANSISTOR CIRCUITRY
Richard S. Walton, Lancaster, Pa., assignor to Hamilton Watch Company, Lancaster, Pa., a corporation of Pennsylvania
Filed Oct. 16, 1968, Ser. No. 768,076
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 **14 Claims**

There is disclosed herein an electronically controlled timepiece suitable for use as a wrist watch employing an

electronic oscillator operating at a frequency substantially in excess of the desired timekeeping rate, frequency reduction circuitry formed of a series of transistor stages operative in response to changes in voltage rather than current or power level changes to produce timing signal of the required frequency, actuating means responsive to the timing signal and a time display operated by the actuating means.



3,560,999

CIRCULAR KNITTING MACHINES

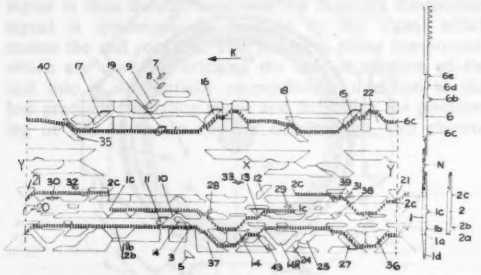
Frederick Edward Deans, Leicester, and Richard James Carter, Wigston, England, assignors to The Bentley Engineering Company Limited

Filed Apr. 5, 1966, Ser. No. 540,260

Claims priority, application Great Britain, Apr. 10, 1965, 15,325/65

Int. Cl. D04b *9/10, 9/20*

U.S. Cl. 66—14 7 Claims



A circular knitting machine, primarily for knitting sleeve-forming fabric contiguous to tubular body-forming fabric, having at least two circumferentially-spaced yarn feeding and knitting stations and means for knitting simultaneously, in reciprocation, diametrically-opposed sutured pouches forming a portion of the sleeve-forming fabric. Selection butts and cams divide the needles into two diametrically-opposed groups whereby, during reciprocatory knitting, one group knits one pouch at one station while the other group knits the other pouch at another station.

3,561,000

KNITTED GARMENT AND METHOD

Harry Wignall, Leicester, England, assignor to The Bentley Engineering Company Limited

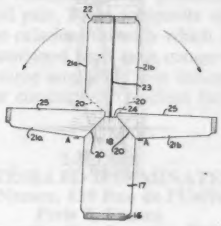
Continuation of application Ser. No. 433,334, Feb. 17, 1965. This application July 22, 1968, Ser. No. 752,116

Claims priority, application Great Britain, Feb. 28, 1964, 8,362/64

Int. Cl. D04b *9/20*

U.S. Cl. 66—51 17 Claims

A novel garment is produced by knitting a body encircling tubular member having selected enlarged areas, slitting the tubular member from one end to a point proximate the enlarged areas to define half-courses in the sections on both sides of the slit and then seaming the two sections along the silt line to define limb encircling portions.



3,561,001

MACHINE TOOL IN PARTICULAR FOR DRILLING METAL BEAMS

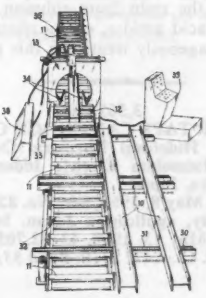
Renato Giuliani, Milan, Italy, assignor to Fabbrica Italiana Cesoie e Punzonatrici Colombo-Guiliani di Colombo & C.S.a.S., Milan, Italy

Filed Sept. 5, 1968, Ser. No. 757,540

Claims priority, application Italy, Sept. 7, 1967, 20,234/67

Int. Cl. B23b *39/14*

U.S. Cl. 77—31 8 Claims



A method and machine tool for drilling the surfaces of metal beams, wherein a single work head is moved around the beam by a suitable supporting and adjustable frame. In such a manner, the tool or tools of the work head can be readily positioned in front of the different beam surfaces to be machined without any need to turn the beam.

3,561,002

THREAD TAKEUP LEVER ARRANGEMENT FOR A SEWING MACHINE

Ramon Casas Robert, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland, a company of Switzerland

Filed Dec. 9, 1968, Ser. No. 782,332

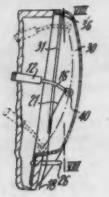
Claims priority, application Switzerland, Dec. 22, 1967, 18,114

Int. Cl. D05b *49/00, 73/02*

U.S. Cl. 112—241 8 Claims

A cover entirely encloses the free end of the takeup

lever. Two slits in the cover permit the sewing thread to be inserted into the cover and left to hang freely over



the end of the takeup lever, which has means to prevent the thread from slipping off the lever end.

3,561,003

SPRAY DRYING PROCESS

Bernard J. Lanham, Chessington, and Vladimir C. Hykel, London, England, assignors to The Magnavox Company, Ft. Wayne, Ind., a corporation of Delaware

No Drawing. Filed Nov. 21, 1967, Ser. No. 684,606
Claims priority, application Great Britain, Nov. 23, 1966, 52,372/66
Int. Cl. C08j *1/07*; C08g *53/02*
U.S. Cl. 106—22 **11 Claims**

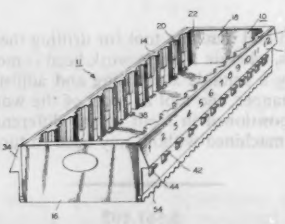
Particulate resins of particle size no more than 30 microns are produced by spray-drying a mixture comprising a solution of the resin and a non-solvent for the resin. Particulate inks may be prepared by incorporating in the mixture before spray-drying a colorant and/or a filler. The amount of non-solvent in the mixture depends on the particular non-solvent, resin and resin solution used, but it does not exceed the amount required to cause incipient precipitation of the resin from solution. Resins such as polymeric fatty acid amides, epoxy resins or polystyrene are most advantageously treated in this process.

3,561,004

TRAY FOR TAPE CARTRIDGE CHANGER

Isao Kozu and Hidetoshi Kurihara, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed May 8, 1969, Ser. No. 822,925
Claims priority, application Japan, May 10, 1968, 43/31,771; May 13, 1968, 43/32,705, 43/32,706
Int. Cl. A47f *1/10*; B65d *83/00*
U.S. Cl. 206—1 **5 Claims**



A tray for a tape cartridge changer. The tray is provided with a frame which is capable of receiving a plurality of tape cartridges arranged side by side in a line, and has supporting means which are mounted on the frame for engaging the side faces of the cartridges to hold them in the frame. The supporting means are movable so that at least one of the cartridges can freely move through the tray when the tray is loaded on a tape cartridge changer.

3,561,005

PROCESS FOR THE PRODUCTION OF 2,4-DICHLOROPYRIMIDINE - 5-CARBOXYLIC ACID CHLORIDE

Tibor Somlo and Alain Claude Rochat, Birsfelden, near Basel, Switzerland, assignors to J. R. Geigy A.G., Basel, Switzerland

No Drawing. Filed Sept. 10, 1968, Ser. No. 758,690
Claims priority, application Switzerland, Sept. 20, 1967, 13,165/67
Int. Cl. C07d *51/36*
U.S. Cl. 260—251 **7 Claims**

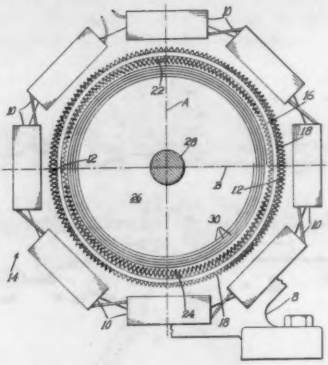
Process for producing 2,4-dichloropyrimidine-5-carboxylic acid chloride by reacting uracil-5-carboxylic acid with a chlorinating agent which may be either phosphorous trichloride and chlorine or phosphorous pentachloride in a reaction medium containing phosphorus oxychloride, the objective compound being recovered in yields above 90% of the theoretical value. The 2,4-dichloropyrimidine-5-carboxylic acid chloride so obtained is sufficiently pure so that it can be further used as acylating agent, e.g. for the production of reactive dyestuffs.

3,561,006

ELECTROMAGNETIC ACTUATORS WITH DEFLECTIBLE ROTOR

Donald R. Humphreys, Topsfield, Mass., assignor to USM Corporation, Flemington, N.J., a corporation of New Jersey

Filed May 22, 1969, Ser. No. 826,878
Int. Cl. H02k *7/06*
U.S. Cl. 310—82 **3 Claims**



A high-response stepping motor incorporates in coaxial relation an open-ended flexspline having inner and outer teeth which cooperate, respectively, with inner and outer, oppositely disposed, circular spline teeth, the meshing occurring simultaneously upon stator energization at spaced circumferential localities rotationally out of phase with each other. The outer circular spline teeth may be formed on stator pole faces, and the inner circular splines may be formed externally on a rotary output member.

3,561,007

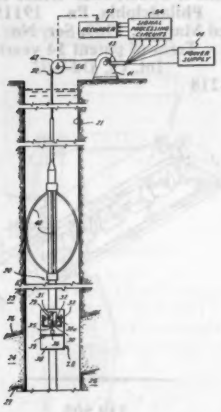
METHODS AND APPARATUS FOR INVESTIGATING EARTH FORMATIONS UTILIZING ROTATING ELECTROMAGNETIC FIELDS

Michel Marie Albert Gouilloud, Houston, Tex., and Julien M. Loeb, Saint-Cloud, France, assignors, by mesne assignments, to Schlumberger Technology Corporation, New York, N.Y., a corporation of Texas

Filed Sept. 11, 1968, Ser. No. 758,941
Claims priority, application France, Sept. 12, 1967, 120,779
Int. Cl. G01v *3/08, 3/18*
U.S. Cl. 324—5 **26 Claims**

In accordance with illustrative embodiments of the present invention, methods and apparatus for determin-

ing the positioning of formation bedding planes by rotating one or more electromagnetic fields through formations surrounding a borehole are illustrated. In one embodiment, a solenoid-type coil is energized with current and rotated at a substantially constant velocity about an adjustable axis. An amplitude modulated signal will then be produced in the coil if there is a conductivity contrast or gradient in the formation plane which defines the sweep



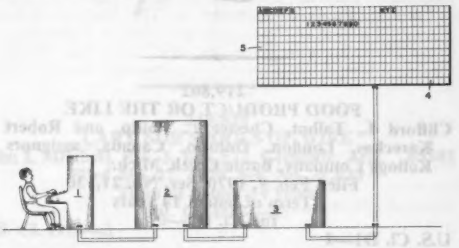
of the electromagnetic field. This amplitude modulated signal is then demodulated and the resulting modulation signal is synchronously detected by the signal which causes the coil rotation. This produces phase components which are used for bringing the axis of rotation of the coil into a substantially perpendicular direction to the low gradient formation plane and indicating the positioning of this plane. In another embodiment, two electromagnetic fields are rotated around a borehole at spaced apart depth levels by sequentially coupling a plurality of circumferentially spaced coil pairs to the adjoining formations. The signals from each coil of the coil pairs are combined in selected relationships to produce a composite signal for each coil pair. These composite signals are then used to adjust the relationship with which the individual coil signals are combined until each composite signal has substantially the same amplitude thus indicating the positioning of the low conductivity gradient formation plane.

3,561,008

REMOTE CONTROLLED ILLUMINATED DISPLAYS

Edgard Nazare, 129 Rue de l'Universite, Paris 7, France

Continuation of application Ser. No. 564,669, July 12, 1966. This application July 16, 1969, Ser. No. 846,639
Claims priority, application France, July 12, 1965, 24,352; Sept. 17, 1965, 31,706; Nov. 26, 1965, 39,917; July 6, 1966, 68,405
Int. Cl. G08b 5/24
U.S. Cl. 340—379 **4 Claims**



This invention relates to a remotely-controlled display system and, more particularly, to such a system wherein the elements of display are mounted on movable elements operated by pulse-energized actuators.

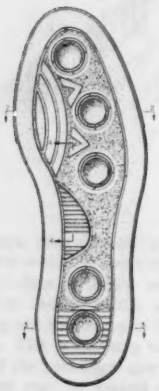
DESIGNS

FEBRUARY 2, 1971

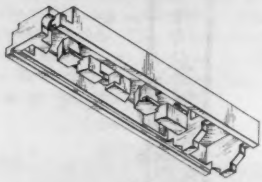
219,801
CEREAL FOOD PRODUCT
Charles C. Harwood, Elgin, and Raleigh J. Wilkinson, Arlington Heights, Ill., assignors to The Quaker Oats Company
Filed Sept. 25, 1969, Ser. No. 19,293
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—1

219,802
FOOD PRODUCT OR THE LIKE
Clifford L. Talbot, Chester L. Philip, and Robert R. Kareckas, London, Ontario, Canada, assignors to Kellogg Company, Battle Creek, Mich.
Filed Feb. 9, 1970, Ser. No. 21,330
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—1

219,803
SHOE SOLE
Clarence E. Phillips, Taneytown, Md., assignor to Cambridge Rubber Company, Taneytown, Md.
Filed Oct. 27, 1969, Ser. No. 19,739
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

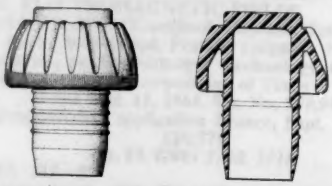


219,804
DRAPERY MASTER CARRIER
Ellis I. Toder, 9225 Grace Lane, Philadelphia, Pa. 19115
Filed Mar. 17, 1969, Ser. No. 16,271
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—218

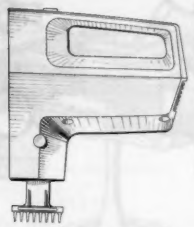


219,805
PACKAGING CONTAINER
André Courréges, Neuilly, France, assignor to Courréges Parfums, Paris, France
Filed Jan. 23, 1970, Ser. No. 21,043
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—237

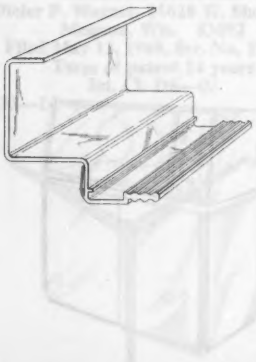
219,806
CHAMPAGNE BOTTLE STOPPER
James E. Coleman and Jay M. Doyle, Modesto, Calif., assignors to United Packaging Co., Modesto, Calif.
Filed Sept. 12, 1969, Ser. No. 19,126
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—285



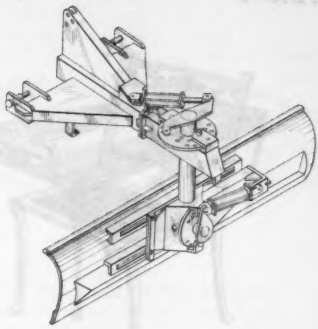
219,807
ELECTRIC MEAT TENDERIZER
Frank J. Di Sesa, Jr., Columbus, Ind., assignor to Hamilton Cosco, Inc., Columbus, Ind.
Filed Jan. 19, 1970, Ser. No. 20,965
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D11—1



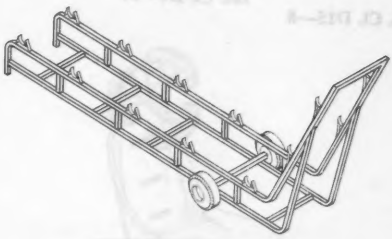
219,808
PLASTIC COVER FOR A DOORWAY
Martin Wilfred Crowley, 31 St. Paul's St., London, N.1, England; Michael Mitchell, 1 Fir Trees, Tidy's Lane, Epping, Essex, England; and Franz Ferdinand Levi, Flat 3, 26 Alexandra Grove, London, N.12, England
Filed Aug. 14, 1969, Ser. No. 18,690
Claims priority, application Great Britain Mar. 10, 1969
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—6



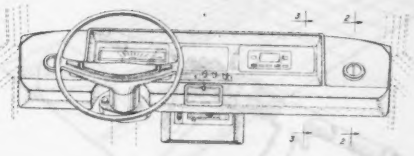
219,809
MULTIPLE ADJUSTABLE BULLDOZER UNIT
John G. Coontz, P.O. Box 104, Kiowa, Kans. 67070
Filed Feb. 3, 1969, Ser. No. 15,608
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—3



219,810
CART FOR SPOOLS OF WIRE
John I. Mitchell, Rte. 3, Box 577, Glendale, Ariz. 85301
Filed Jan. 22, 1970, Ser. No. 21,033
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—3



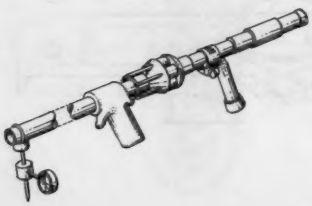
219,811
AUTOMOBILE INSTRUMENT PANEL
Piergiorgio Tronville, Heilbronn, Germany, and Pio Manzu, Turin, Italy, assignors to Deutsche Fiat Aktiengesellschaft Heilbronn, Baden-Wurttemberg, Germany
Filed Mar. 27, 1969, Ser. No. 16,489
Claims priority, application Germany Oct. 3, 1968
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—6



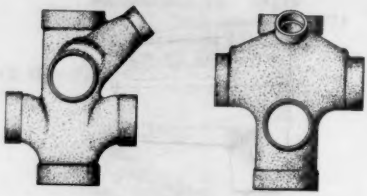
219,812
CHAIR
Judkins E. Wilkinson, Birmingham, Ala., assignor to Atlanta Stove Works, Inc.
Filed July 14, 1969, Ser. No. 18,185
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—1

219,813
BUCKET SEAT SHELL
Steve T. McQueen, 14732 Oxnard St., Los Angeles, Calif. 91401
Filed Jan. 12, 1970, Ser. No. 20,900
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—8

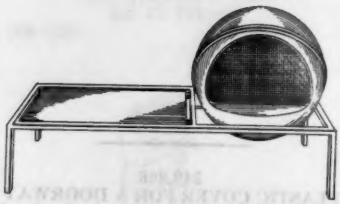
219,814
BLOW GUN
Paul E. Gaylord, 2504 NW. 22nd Court, Miami, Fla. 33142
Filed Nov. 29, 1968, Ser. No. 14,725
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—3



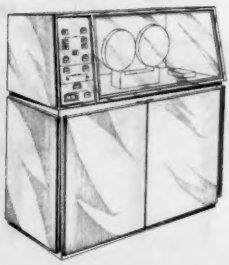
219,815
PLUMBING FITTING
Stanley R. Palowsky, 103 Somerset Drive, Monroe, La. 71201
Filed Sept. 8, 1969, Ser. No. 19,056
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40



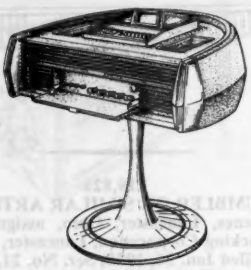
219,816
COMBINED FIREPLACE AND TABLE
William H. Punt, Prescott, Ontario, Canada, assignor to Wallace-Murray Canada Limited
Filed Mar. 27, 1969, Ser. No. 16,476
Claims priority, application Canada Oct. 31, 1968
Term of patent 7 years
Int. Cl. D23—*03;* D6—*01*
U.S. Cl. D23—97



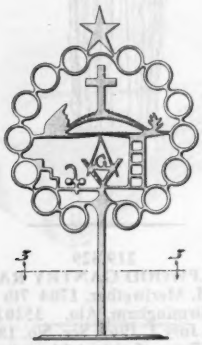
219,817
MICROFILM RECORDER FOR COMPUTER DATA
Jay Sucre, Exton, Pa., William A. Hoffman, Collingswood, N.J., and Nazareno D. Marucci, Philadelphia, Pa., assignors to Burroughs Corporation, Detroit, Mich.
Filed June 12, 1969, Ser. No. 17,673
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



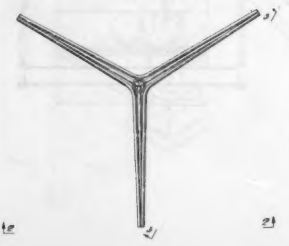
219,818
COMBINED TAPE RECORDER AND REPRODUCER THEREFOR
Takemi Ebata, Kyoto, and Shinroku Tsutsumi, Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 24, 1969, Ser. No. 20,256
Claims priority, application Japan June 10, 1969
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



219,819
MASONIC ORNAMENT
George M. Wallace, 64 Clinton St., Paterson, N.J. 07501
Filed July 1, 1969, Ser. No. 18,036
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23



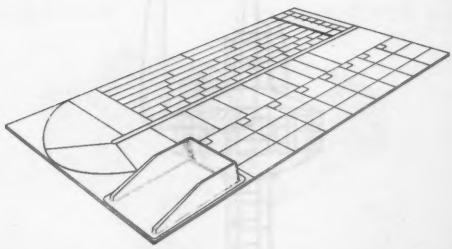
219,820
BASE SUPPORT FOR FURNITURE OR SIMILAR ARTICLE
Dieter F. Wegner, 11628 W. Shorecliff, Mequon, Wis. 53092
Filed May 13, 1969, Ser. No. 17,140
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—14



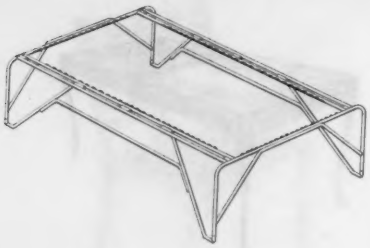
219,821
TABLE
Judkins E. Wilkinson, Birmingham, Ala., assignor to Atlanta Stove Works, Inc.
Filed July 18, 1969, Ser. No. 18,267
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—14

219,822
GAME PROJECTILE
John Rockaitis, 3920 W. 60th Place, Chicago, Ill. 60629
Filed July 24, 1969, Ser. No. 18,384
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

219,823
GAME BOARD
Joseph Imperato, Selden, N.Y., assignor to Riders Up, Inc., Selden, N.Y.
Filed Aug. 11, 1969, Ser. No. 18,627
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

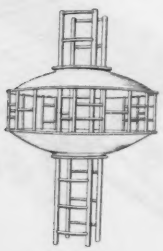


219,824
TRAMPOLINE FRAME
Richard W. Swanson, 6374 S. Lafayette Place, Littleton, Colo. 80120
Filed Aug. 28, 1969, Ser. No. 18,887
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5



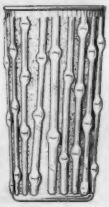
219,825
PLAYGROUND CLIMBER
Robert S. Wormser, Hillsdale, Mich., assignor to Game Time, Inc., Litchfield, Mich.
Filed Feb. 9, 1970, Ser. No. 21,349
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

219,826
PLAYGROUND CLIMBER
Robert S. Wormser, Hillsdale, Mich., assignor to Game Time, Inc., Litchfield, Mich.
Filed Feb. 9, 1970, Ser. No. 21,354
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

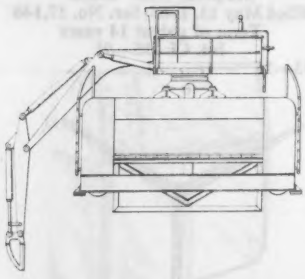


219,827
TOBOGGAN
Arthur Mihalcheon, 14815 125th Ave., Edmonton, Alberta, Canada
Filed June 27, 1969, Ser. No. 17,912
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—14

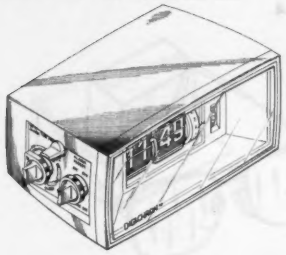
219,828
TUMBLER OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Jan. 26, 1970, Ser. No. 21,077
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D36—8



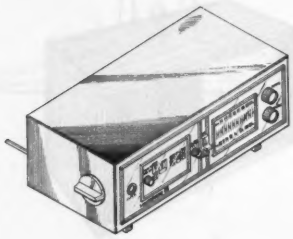
219,829
PULPWOOD GANTRY RAKE
George M. Meriwether, 1704 7th Ave. N., Birmingham, Ala. 35203
Filed July 2, 1969, Ser. No. 18,034
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D41—1



219,830
COMBINED DIGITAL CLOCK AND TIMER
Kaoru Eguchi, 70—25 Yellowstone Blvd., Forest Hills, N.Y. 11375
Filed Jan. 29, 1970, Ser. No. 21,133
Term of patent 3½ years
Int. Cl. D10—*01*
U.S. Cl. D42—7

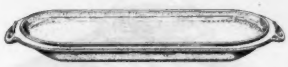


219,831
DIGITAL CLOCK RADIO
Kaoru Eguchi, 70—25 Yellowstone Blvd., Forest Hills, N.Y. 11375
Filed Jan. 29, 1970, Ser. No. 21,134
Term of patent 3½ years
Int. Cl. D10—*01*
U.S. Cl. D42—7

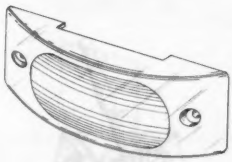


219,832
TIMER
Mel Appel, Livingston, and Martin Schnur, Fort Lee, N.J., assignors to Gemco-Ware Inc., Freeport, N.Y.
Filed Apr. 15, 1970, Ser. No. 22,443
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D42—7

219,833
COMBINED COVER AND COOKING GRILL
Judkins E. Wilkinson and Clarence R. Smith, Birmingham, Ala., assignors to Atlanta Stove Works, Inc.
Filed July 24, 1969, Ser. No. 18,361
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—1



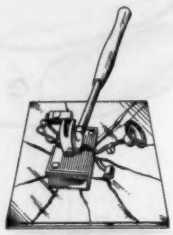
219,834
LENS FOR AUTOMOTIVE LIGHT
Charles J. Newman, Madison, Ind., and Elbert J. Lucas, Andalusia, Ala., assignors to The Grote Manufacturing Company, Madison, Ind.
Filed May 8, 1969, Ser. No. 17,069
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D48—32



219,835
BACK PACK VACUUM CLEANER
Louis L. Otto, North Muskegon, and Cecil B. Land, Muskegon, Mich., assignors to Clarke Floor Machine Division, Studebaker Corporation, Muskegon, Mich.
Filed Nov. 24, 1969, Ser. No. 20,233
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D49—11

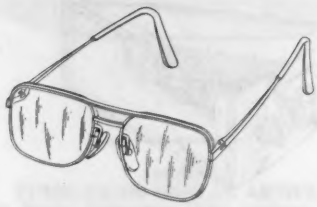
219,836
LIQUID METER UNIT
Raymond Loewy, Paris, France, assignor to Stanley Edward Matthews, London, England
Filed July 17, 1969, Ser. No. 18,255
Claims priority, application Great Britain Jan. 24, 1969
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—2

219,837
RADIO RECEIVER OR SIMILAR ARTICLE
Ralph K. Schwitzgebel, 5 Pelham Road, Waltham, Mass. 02154
Filed Jan. 23, 1969, Ser. No. 15,464
Term of patent 3½ years
Int. Cl. D14—*03*
U.S. Cl. D56—4

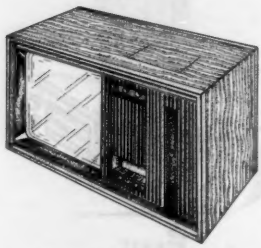


219,838
OPHTHALMIC SPECTACLES
Luc Andre Marcel Tagnon, Paris, France, asisgnor to Société des Lunetiers, société en commandite simple, Paris, France
Filed Aug. 7, 1969, Ser. No. 18,575
Claims priority, application France June 17, 1969
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D57—1

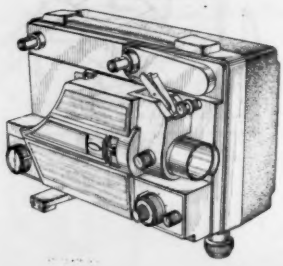
219,839
COMBINED RECORD PLAYER AND RADIO OR SIMILAR ARTICLE
Soji Takada, Kyoto, and Ikuo Nishimura, Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Oskawa, Japan
Filed July 7, 1969, Ser. No. 18,078
Claims priority, application Japan Jan. 24, 1969
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4



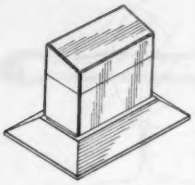
219,840
CASSETTE OPERATED AUDIO-VIDEO PROJECTION CABINET OR SIMILAR ARTICLE
Masayuki Sakuma, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh
Filed May 20, 1969, Ser. No. 17,245
Term of patent 7 years
Int. Cl. D16—*04*
U.S. Cl. D61—1



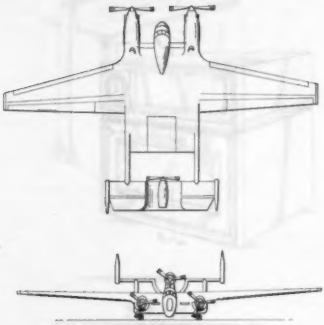
219,841
MOTION PICTURE PROJECTOR
Tadamasa Manome, Ohmiya-shi, and Yoh Tanaka, Tokyo, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Kanagawa-ken, Japan
Filed Aug. 27, 1969, Ser. No. 18,873
Claims priority, application Japan Apr. 8, 1969
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1



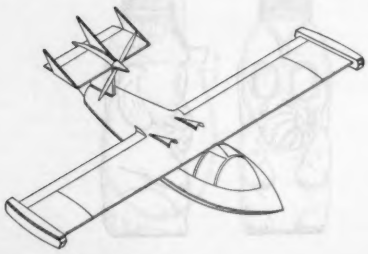
219,842
COMBINED RUBBER STAMP AND BASE THEREFOR
Harold L. Miller, 7730 Emerson Ave. N., Minneapolis, Minn. 55430
Filed Nov. 17, 1969, Ser. No. 20,126
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—10



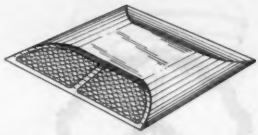
219,843
AIRCRAFT
Charles G. Fredericks, Silver Spring, Md., assignor to Occidental Aircraft Corporation, Washington, D.C.
Filed June 12, 1969, Ser. No. 17,679
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1



219,844
AMPHIBIOUS AIRCRAFT
Cornelius Biemond, 105 S. 14th St., Ord, Nebr. 68862
Filed July 14, 1969, Ser. No. 18,196
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1



219,845
ROADWAY REFLECTOR
Peter Hedgewick, Windsor, Ontario, Canada, assignor to Reflex Corporation of Canada Limited, Amherstburg, Ontario, Canada
Filed June 11, 1968, Ser. No. 12,299
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1

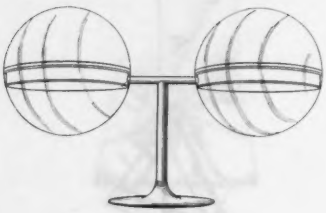


219,846
SIGNAL
Morton A. Sernovitz, 8642 Keystone, Skokie, Ill. 60076
Filed Oct. 6, 1969, Ser. No. 19,421
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1

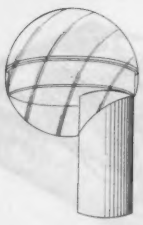
219,847
CARD DIVIDER CLIP
Charles H. Nervig, Berea, Ohio, assignor to American Greeting Corporation, Cleveland, Ohio
Filed June 9, 1969, Ser. No. 17,580
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D74—2

219,848
DISPLAY STAND
Raymond Loewy, Paris, France, assignor to Stanley Edward Matthews, London, England
Filed July 17, 1969, Ser. No. 18,242
Claims priority, application Great Britain Feb. 21, 1969
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9

219,849
DISPLAY STAND
Raymond Loewy, Paris, France, assignor to Stanley Edward Matthews, London, England
Filed July 29, 1969, Ser. No. 18,452
Claims priority, application Great Britain Mar. 5, 1969
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9

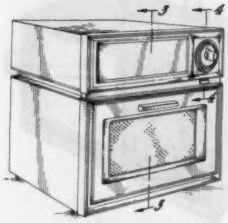


219,850
DISPLAY STAND
Raymond Loewy, Paris, France, assignor to Stanley Edward Matthews, London, England
Filed July 29, 1969, Ser. No. 18,453
Claims priority, application Great Britain Mar. 5, 1969
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9



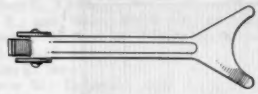
219,851
DISPLAY STAND
Raymond Loewy, Paris, France, assignor to Stanley Edward Matthews, London, England
Filed July 29, 1969, Ser. No. 18,457
Claims priority, application Great Britain Mar. 5, 1969
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9

219,852
MICROWAVE OVEN
Alan W. Duncan, Itasca, and John L. Berman, Hickory Hills, Ill., assignors to Roper Corporation, Kankakee, Ill.
Filed Sept. 17, 1969, Ser. No. 19,195
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D81—4

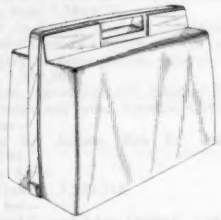


219,853
INFANT FEEDING BOTTLE
Gene H. Swanner, Paducah, Ky., assignor to Dolly Bottle, Incorporated
Filed Jan. 8, 1970, Ser. No. 20,807
Term of patent 14 years
Int. Cl. D24—*05*; D9—*01*
U.S. Cl. D83—8

219,845
FALSE EYELASH APPLICATOR
Pearl Howard, 441 S. Barrington Ave., Los Angeles, Calif. 90049
Continuation-in-part of design application Ser. No. 15,009, Nov. 19, 1968. This application Mar. 6, 1970, Ser. No. 21,773
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D86—10

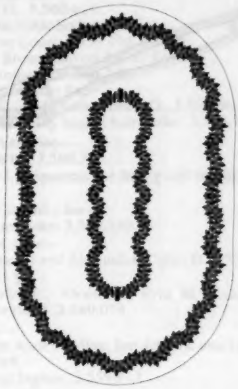


219,855
CARRYING CASE COVER FOR A PORTABLE SEWING MACHINE
Henry Dreyfuss, South Pasadena, Calif., assignor to The Singer Company, New York, N.Y.
Filed May 26, 1969, Ser. No. 17,341
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5



219,856
UMBRELLA HANDLE
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada
Filed Oct. 20, 1969, Ser. No. 19,641
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3

219,857
TABLECLOTH
Carlos Mach Brosa, Barcelona, Spain, assignor to Benjamin M. Jabara & Sons, New York, N.Y.
Filed Sept. 23, 1969, Ser. No. 19,265
Claims priority, application Spain May 26, 1969
Term of patent 7 years
Int. Cl. D6—*09*
U.S. Cl. D92—26



219,858
TABLE NAPKIN
Carlos Mach Brosa, Barcelona, Spain, assignor to Benjamin M. Jabara & Sons, New York, N.Y.
Filed Sept. 23, 1969, Ser. No. 19,266
Claims priority, application Spain May 26, 1969
Term of patent 7 years
Int. Cl. D6—*09*
U.S. Cl. D92—26

219,859

KNIFE OR SIMILAR ARTICLE

William J. Abel, Jackson, Tenn., assignor to Consolidated Aluminum Corporation, Jackson, Tenn.

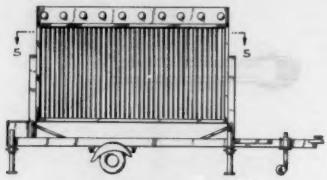
Filed Feb. 25, 1970, Ser. No. 21,602
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D95—3

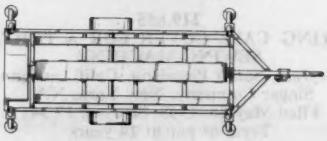
219,860

PORTABLE ILLUMINATED SIGN

Stephen L. Burts and Dennis G. Jones, both of 4306 Hamilton Road, Columbus, Ga. 31902

Filed Oct. 30, 1969, Ser. No. 19,847
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12





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Beug, Lorenz; and Maier, Rolf, to Messerschmitt-Bolkow GmbH. Method and apparatus for determining the displacement of a construction equipment guided along a desired course by a laser beam. 3,560,753, Cl. 250-215.

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Blenkarn, Kenneth A., to Pan American Petroleum Corporation. Load distribution in elongated members of vertically moored drilling vessel. 3,559,411, Cl. 61-46.5

Blenkarn, Kenneth A.; and Dixon, David A., to Pan American Petroleum Corporation. System for relieving stress at the top and bottom of vertical tubular members in vertically moored platforms. 3,559,410, Cl. 61-46.5

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Bundorf, Ronald T., to General Motors Corporation. Dirigible wheel suspension including means for inducing lateral acceleration response understeer. 3,560,016, Cl. 280-96.2

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Burk, Emmett H., Jr.; and Carlos, Donald D., to Sinclair Research, Inc. Aromatic poly(nitrile carbonates). 3,560,518, Cl. 260-307.

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Burk, George A., to Dow Chemical Company, The. Preparation of brominated styrene. 3,560,580, Cl. 260-650.

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Busch, Werner; and Hufnagel, Paul, to Krauss-Maffei, Aktiengesellschaft. Fluid pump or motor. 3,560,119, Cl. 418-55.

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Carr, Ben W. Blender mixer attachments for use with household garbage disposer units. 3,559,897, Cl. 241-101.

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Cavagnero, Erman V.; and Loftus, Joseph F., to Torrington Manufacturing Company, The. Method for making formed articles with shaped end portions from strip stock. 3,559,263, Cl. 29-148.4

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Central Research Laboratories, Inc.: *See—*
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Cereghetti, Marco; Furst, Andor; Vecchi, Max; and Vetter, Walter, to Hoffman-La Roche Inc. 3-Silyl-ether steroids. 3,560,532, Cl. 260-397.4

Cerioni, Renzo Giuseppe. Apparatus for gripping and stretching the mouth of sacks and similar non-rigid containers in preparation for their sealing by sewing. 3,559,372, Cl. 53-393.

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Champagnat, Alfred; and Filosa, Jean Antoine, to British Petroleum Company Limited, The. Process for the removal of straight chain hydrocarbons from petroleum fractions. 3,560,341, Cl. 195-3.

Chandra, Kailash Charles, to Borg-Warner Corporation. Fire-retardant cellulosic compositions. 3,560,479, Cl. 260-212.

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Chereshkevich, Lev Vikentievich; Chegodaev, Dmitry Dmitrievich; and Yavzina, Nadezhda, Elizarovna. Method for production of polytetrafluoro- ethylene multilayer coatings on heat- resistant materials. 3,560,249, Cl. 117-93.4

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Childress, Scott J.; and Szabo, J Lester, to American Home Products Corporation. 2-(p-Alkylphenyl)-N-sulfonylalkanoylamides. 3,560,563, Cl. 260-556.

Childress, Scott J.; and Szabo, J. Lester, to American Home Products Corporation. 1-Amino-N-sulfonylcyclopentanecarboxamides. 3,560,565, Cl. 260-556.

Chilton, Henry Thomas Joseph, to Monsanto Chemicals Limited. Process for concentrating silica aquasols. 3,560,400, Cl. 252-313.

Chiron, Bernard, to Societe Lignes Telegraphiques et Telephoniques. Microstrip devices having strip conductor coated on ferrite substrate. 3,560,892, Cl. 333-1.1

Chiu, Winton C. Bag with one-way entrance. 3,559,329, Cl. 43-55.

Chmelir, Miroslav; and Marek, Miroslav. Method of polymerization of isobutylene utilizing $AlBr_3$ or AlI_3 with an activating compound. 3,560,474, Cl. 260-94.8

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Christener, Hanspeter, to Aktiengesellschaft Brown, Boveri & Cie. Lightning arrester with a rupturable diaphragm for gas pressure release. 3,560,794, Cl. 315-36.

Christensen, James D. Sizer for draperies. 3,559,315, Cl. 38-102.3

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Christopher, Bernard A., 25% to Baczynski, Chester, 25% to Bartoletti, James, and 25% to Featherstone, Chris. Fish warning device. 3,559,327, Cl. 43-17.

Chu, Edward, to Du Pont de Nemours, E. I., and Company. Apparatus for producing a hollow strip of polymeric material. 3,559,241, Cl. 18-14.

Chung, David H.; and Terrell, Bill H., to Texas Instruments, Incorporated. Nonsaturated high speed drive gate. 3,560,760, Cl. 307-215.

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Webb, James E., Administrator of the National Aeronautics and Space Administration with respect to an invention of,; Clark, James; Soffen, Gerald A.; and Stuart, Jerry L.,3,560,161.

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Clark, Victor Malcolm; Gregory, Gordon Ian; and Cocker, John Derek, to Glaxo Laboratories Limited. Production of azacarbazoles. 3,560,361, Cl. 204-158.

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Clason, Donald L.; and Coleman, Lester E., said Clason assor. to Lubrizol Corporation, The. Preparation of episulfides from epoxides. 3,560,524, Cl. 260-327.

Claxton, William E.; and Holden, Harold C., to Firestone Tire & Rubber Company, The. Blend optimizer comprising an assembly of variable factor potentiometers. 3,560,725, Cl. 235-193.

Clay, Burton R.; and Haddad, Theodore A., to United States of America, Navy, mesne. Flash lamp. 3,560,787, Cl. 313-112.

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Cline, Ted L. Deep tillage plow. 3,559,747, Cl. 172-421.
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Clough, Victor J. Means for constructing a hollowed wall concrete structure. 3,559,944, Cl. 249-36.
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Crane, Robert L., to Tol-O-Matic Inc. Brake motor. 3,559,771, Cl. 188-71.8

Crane, William T.; Landmark, Kenneth L.; and Rosene, Paul A., to Burgess Norton Mfg., Co. Electrical furnace for heating a metallic sleeve. 3,560,709, Cl. 219-406.

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Cunningham, Zed. Weapons System for motor vehicles. 3,559,528, Cl. 89-40.

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Dach, Hansjorg, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Hydraulic control system for brakes, clutches and the like. 3,559,669, Cl. 137-102.

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